REMEDIAL PLANNING ACTIVITIES AT SELECTED UNCONTROLLED HAZARDOUS SUBSTANCES DISPOSAL SITES IN A ZONE FOR EPA REGIONS VI, VII, & VIII

U.S. EPA CONTRACT NO. 68-W9-0032

SCREENING SITE INSPECTION REPORT FOR SITE ASSESSMENT ACTIVITY AT MOUND STREET PCB SITE ST. LOUIS, MISSOURI

Work Assignment No.: 037-7JZZ

May 24, 1996

Prepared for:
U.S. Environmental Protection Agency

Prepared by:

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1.0 INTRODUCTION

Under authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA), Sverdrup Corporation, Inc. (Sverdrup), was tasked by the U. S. Environmental Protection Agency (EPA) Region VII, under Work Assignment Number 37-7JZZ, to conduct a Screening Site Investigation (SSI) at the Mound Street PCB Site located in St. Louis, Missouri. The CERCLIS I.D. number for the site is MO0000093682. St. Louis, Missouri is located in St. Louis County, on the eastern edge of the state. Sverdrup conducted SSI field activities during the week of April 1, 1996.

1.1 SCREENING SITE INSPECTION OBJECTIVES

The objectives of the Mound Street PCB SSI were to investigate the threat to human health and the surrounding environment associated with this site, and in particular, the potential for polychlorinated biphenyl (PCB) contamination. These objectives were evaluated by the verification of benzene and polynuclear aromatic hydrocarbon (PAH) contamination in the shallow alluvial aquifer, verification of soil PAH concentrations, identification of PCB levels below detection limits, and the associated potential impact of contaminants to human health and the environment. The surface water pathway is the primary pathway of concern for the site. The groundwater and soil exposure pathways are of concern in that they contribute to the surface water pathway.

Groundwater sampling and identification of contamination has previously been conducted adjacent to this site, as part of an SSI on the former Laclede Coal Gas Facility. The Mound Street PCB Site is a subsite of the Laclede Coal Gas Site. Contaminants (benzene, PAHs, and cyanide) have been detected in existing monitoring wells. These monitoring wells were installed in a water bearing zone on the west side of the St. Louis concrete flood wall, constructed by the Army Corps of Engineers. There is no groundwater use on the site or within a 4-mile radius of the site on the Missouri side of the Mississippi River. St. Louis and Illinois cities obtain drinking water from intakes located on the Mississippi River; however, only one drinking water intake is located within the 15-mile target distance limit. Several Illinois cities obtain drinking water from the groundwater; however, they are beyond the 4-mile radius target distance.

Soil sampling and identification of contamination has previously been conducted adjacent to this site, also as part of the SSI on the former Laclede Coal Gas Facility. Contaminants include benzene, toluene, xylene, PAHs, and cyanide. These identified contaminants were detected in shallow soil samples and in deeper samples collected during Field Analytical Support Program Screening in boreholes.

Surface water and sediment sampling have previously been conducted adjacent to this site, also as part of the SSI on the former Laclede Coal Gas Facility. Contaminants included PAHs, metals, and cyanide.

Oil samples were collected from the basement of the Mound Street PCB Site building during two different investigations; six samples by the St. Louis Division of Health, and six samples by the E&E/FIT during the Preliminary Assessment (PA) site reconnaissance of the Mound Street Power Plant Site. Two additional samples were collected from manholes in Mound Street by the E&E/FIT during the PA site reconnaissance. The oil samples were analyzed for PCBs, with all results being below the detection limits for PCBs.

1.2 SCOPE OF WORK

The scope of this SSI activity includes the following tasks:

- Review site-specific background information, including the PA report for the Mound Street PCB Site and documents related to the Laclede Coal Gas Facility.

- Prepare a Management Work Plan (MWP) for the activities at the site to include reports and other deliverables to be generated, a level of effort (LOE) schedule, along with an activity schedule with milestone completion dates. The MWP for the Mound Street PCB site was submitted to Region VII EPA on October 12, 1995.

- Conduct a site reconnaissance to verify site conditions and obtain additional background information. The site reconnaissance at the Mound Street PCB site was conducted by Sverdrup personnel on December 6, 1995.

- Conduct a SSI scoping meeting with the Region VII EPA Site Assessment Manager (SAM) to propose a strategy for sampling the site with available resources. The scoping meeting was held at the Region VII EPA headquarters on December 20, 1995.

- Prepare a Field Sampling Plan (FSP) for the site to include sampling procedures, field methods, proposed sample locations, analytical services request (ASR), quality assurance and quality control (QA/QC) measures, and project management. The FSP for the site was approved by Region VII EPA on March 26, 1996.

- Conduct sampling activities as per the sampling strategy discussed in the scoping meeting and procedures outlined in the FSP. Sampling activities at the site were conducted on April 2 - 3, 1996.

- Calculate a draft site score using Site Inspection Worksheets so that a priority for future work at the site, if warranted, can be assigned.

- Prepare a draft SSI report including a summary of site-specific information. The summary includes analytical results collected by Sverdrup and additional site recommendations.

- Prepare a final SSI report, incorporating any revisions requested by the Region VII EPA comments.

2.0 SITE DESCRIPTION

2.1 SITE LOCATION

The Mound Street PCB Site is located in the City of St. Louis at the eastern end of Mound Street (near the intersection of Mound Street and First Street) (Figure 1). The site is on the western side of the concrete flood wall constructed along the Mississippi River by the U.S. Army Corps of Engineers. The geographic coordinates of the site are 38° 38' 34.0" north latitude and 90 10' 57.2" west longitude (Reference 8). The site can be reached by traveling north on Broadway from Interstate 64, or south on Broadway from the Salisbury Street exit off Interstate 70. From Broadway take Mullanphy Street east, and turn north (left) onto a gravel roadway just past the Petroleum, Fuel and Terminal-Apex Oil (PFT-Apex Oil) facility on the left. Take the gravel roadway north to Mound Street. The site is encompassed by Mound Street, the gravel roadway, and the PFT-Apex Oil facility (Figure 2).

2.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

The Mound Street PCB Site is part of the Laclede Coal Gas Site (MOD981715980). The Laclede Coal Gas Site also includes the PFT-Apex Oil facility located west and south of the Mound Street PCB Site (Figure 3).

The total area of the Mound Street PCB Site is estimated at approximately 1.5 acres (References 15 and 22). The buildings on the site were demolished in 1991, and the property currently has no structures upon it (Appendix A, Photo 1). The property is owned by McKinley Iron, Inc. located at 3620 North Hall Street, St. Louis, Missouri. Mr. Herman Gellman, representative of McKinley Iron, was present during a portion of the SSI site reconnaissance activities conducted at the site on December 6, 1995. Mr Gellman was interviewed during the site reconnaissance. He did not know if the basement walls and floor were removed during building demolition. He did state that the basement area was probably filled with demolition debris. He was not aware of any unusual observations made, such as stained soil or odors, during the building demolition. He estimated the basement depth to be between 12 and 14 feet. Mr. Gellman stated the property was originally purchased from Union Electric to salvage power plant equipment.

The site is roughly rectangular in shape and is bordered on three sides by industrial property (Figure 2). Gravel roads are located along the property perimeter, with Mound Street being the northern boundary. An east-west dirt path has been made across the property. No fencing or other barrier exists around the property. Bricks, rock, wood, metal, brush, and concrete debris are located on the southern portion of the property. Several small soil piles were observed along the southeastern edge of the property (Appendix A, Photo 2). Two 55-gallon drums were also observed adjacent to the debris. No visible markings were noted on the drums and no attempt was made to open them. The contents of the drums are unknown. The northern portion is overgrown with grass and weeds and other vegetation (Appendix A, Photo 3). The general surface runoff is toward the east and south. To the east is vacant property with railroad tracks, the concrete flood wall, and then the Mississippi River (Reference 22).

The St. Louis Metropolitan Sewer District (MSD), Brooklyn Street pump station is located approximately 575 feet north-northeast of the site. The pump station is located on the west side of the flood wall (Appendix A, Photo 4). Two wells sampled in 1991 by E&E/FIT and three manholes sampled by MSD in 1993 were identified (Figure 2). An abandoned pump house, once part of the Mound Street Power

Plant, is located on the east side of the flood wall. The abandoned pump house is in poor condition. At the time of the site reconnaissance visit, the water level of the Mississippi River was at the bottom of the pump house. According to Mr. Gellman, the property occupied by the abandoned pump house was deeded to the City of St. Louis for the construction of a bike path along the river (Reference 22).

The site is part of the Laclede Gas and Light Company former manufactured gas plant (FMGP), which operated in the late 1800s to the mid-1940s (Figure 3). Laclede Gas used a retort process for coal carbonization in the generation of gas. Approximately 930 million gallons of coal tar waste were produced at this facility. It is estimated that approximately 76 percent of the waste was sold, with the remaining 24 percent being buried on-site (Reference 4). This equates to approximately 224 million gallons of coal tar waste potentially buried at the site. On-site burial was typically conducted in unlined pits. In 1940, operations were split between Laclede Gas Light Company (Laclede Gas) and Laclede Power and Light Company (Laclede Electric) (References 3 and 4).

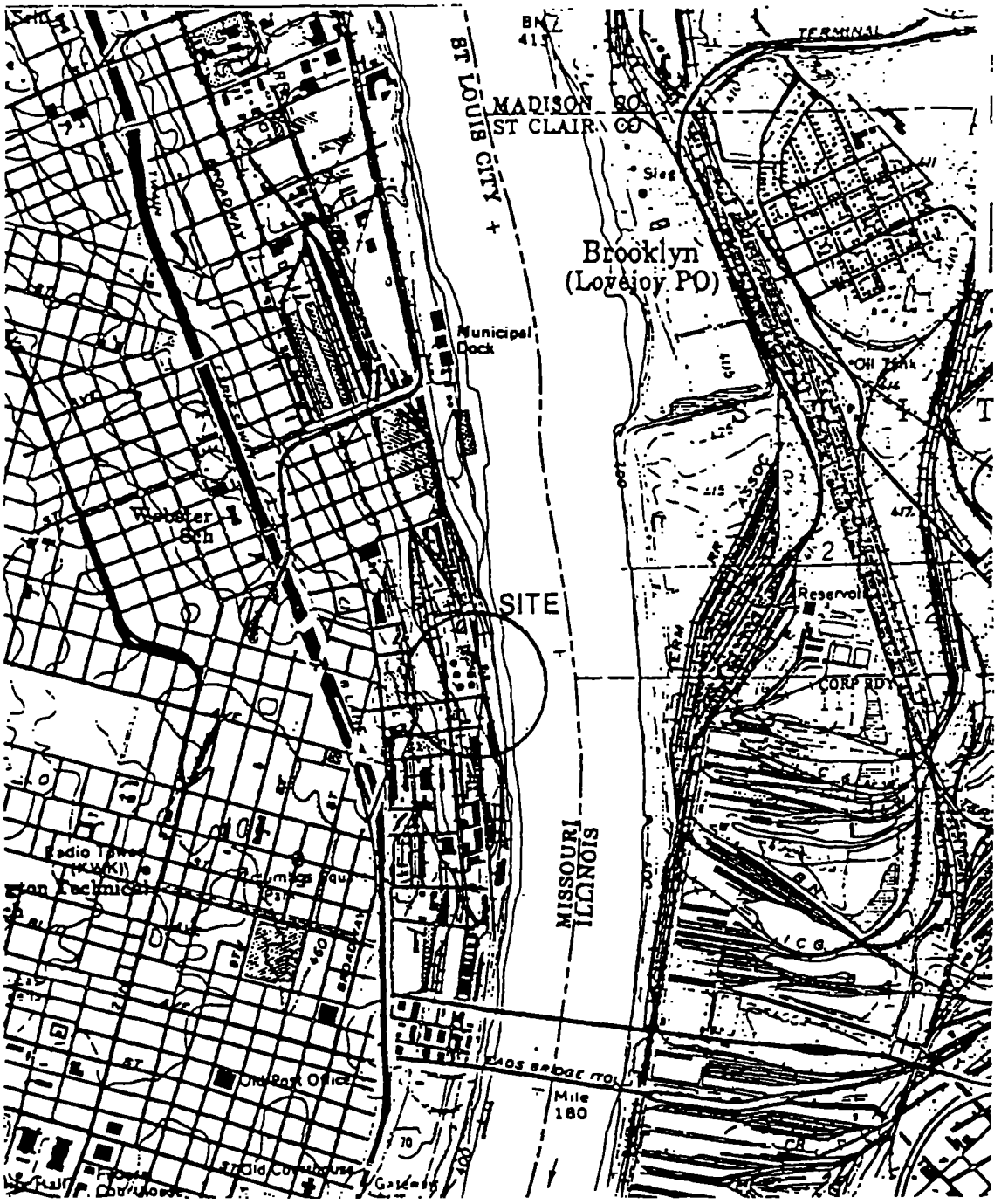
In 1945, Union Electric (UE) purchased the entire coal gas facility and operated the Mound Street Power Plant from 1945 to 1973. UE did not manufacture coal gas at this site. In 1969, the Apex Oil Company purchased the former coal gas works (Laclede Gas) from UE. UE, however, continued to operate its electrical facility from the former Laclede Electric works (Figure 4). The Apex Oil Company utilized the site as a tank farm for the storage of petroleum fuels until the mid-1980s, when it became an asphalt product terminal (Figure 4; References 3 and 4). The PFT-Apex Oil facility is currently still operating at this location.

In 1973, the UE property (Laclede Electric works) was transferred to the Tenlis Company. Tenlis dismantled the power generation and transmission equipment. Transformer oil was reportedly disposed by Midwest Oil Company. The dismantled equipment was sold as scrap metal (Reference 4).

In 1981, Tenlis transferred the property to AZCON (Reference 3). The operations of AZCON are unknown; however, it was reported in the MDNR PA report that AZCON could have been a metal recycling company (Reference 15).

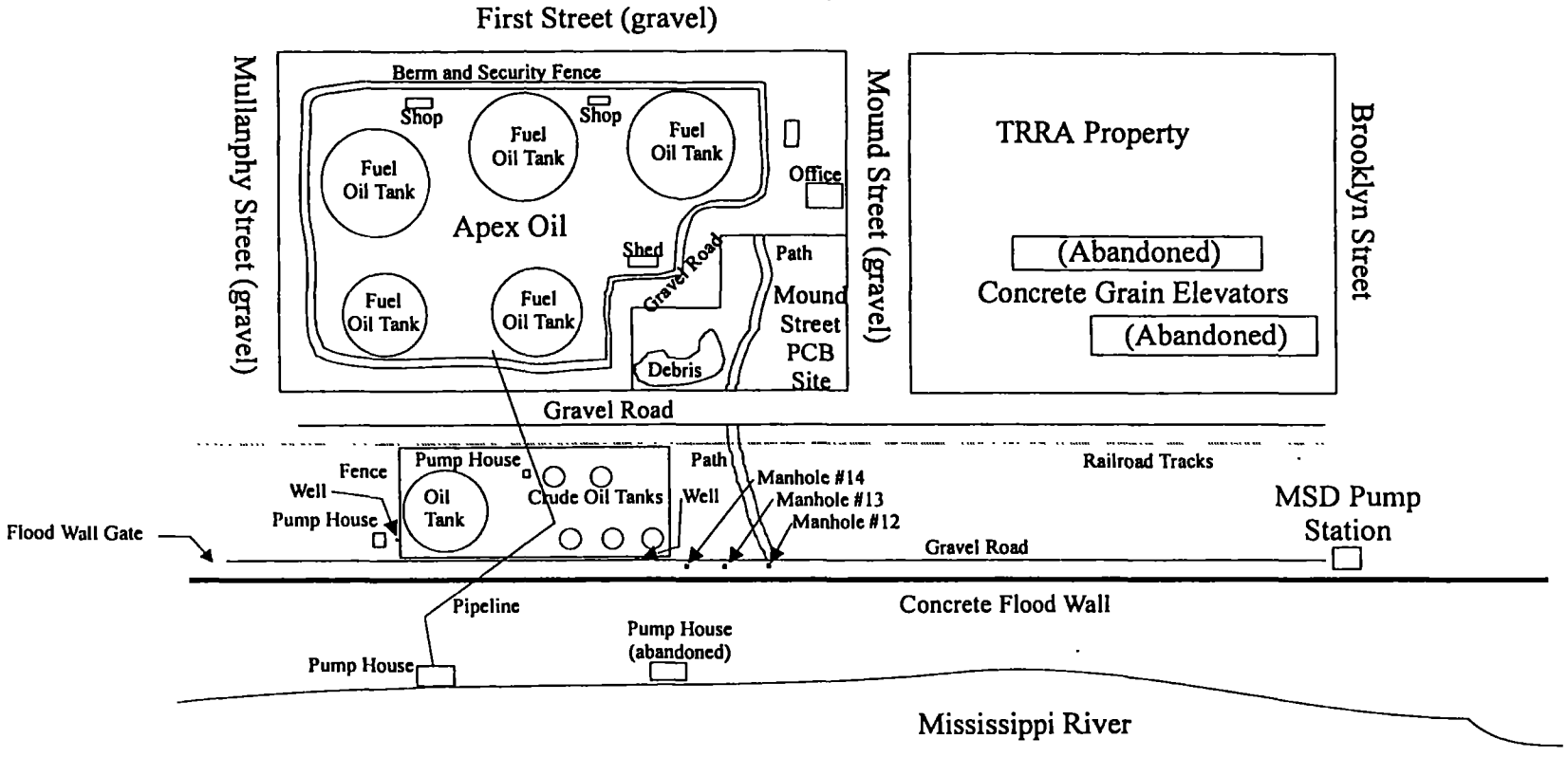
In 1985, Mound Street Corporation became the property owner and leased the building to an individual for an electric motor stripping operation (Reference 3). An oil fire occurred in the basement of the building in 1989, and the building was demolished in the spring of 1991 (Reference 15).

McKinley Iron became the owner of the property in 1993 (Reference 15). The property does not have any buildings or other structures, and is currently vacant (References 7 and 22).



Source: U.S. Geological Survey (USGS). 1954. Granite City, Illinois (photorevised 1974). 7.5 Minute Series Topographic Map.

Project No.: 010865-370303	Mound Street PCB Site St. Louis, Missouri	Site Location Map	Figure No.: 1
	SVERDRUP		11/95



Scale (Approx.)

Scale

0' 200' 400'

N

Sources: E&E/FIT 1991. SSI Laclede Coal Gas Site, St. Louis, Missouri. MDNR 1994. PA Mound Street PCB Site. GEHM 1993. Activities Report, TRRA of St. Louis, First and Mound Streets Site, MDNR Spill Report #07143-KB-1331.

Project No.: 010865-370303

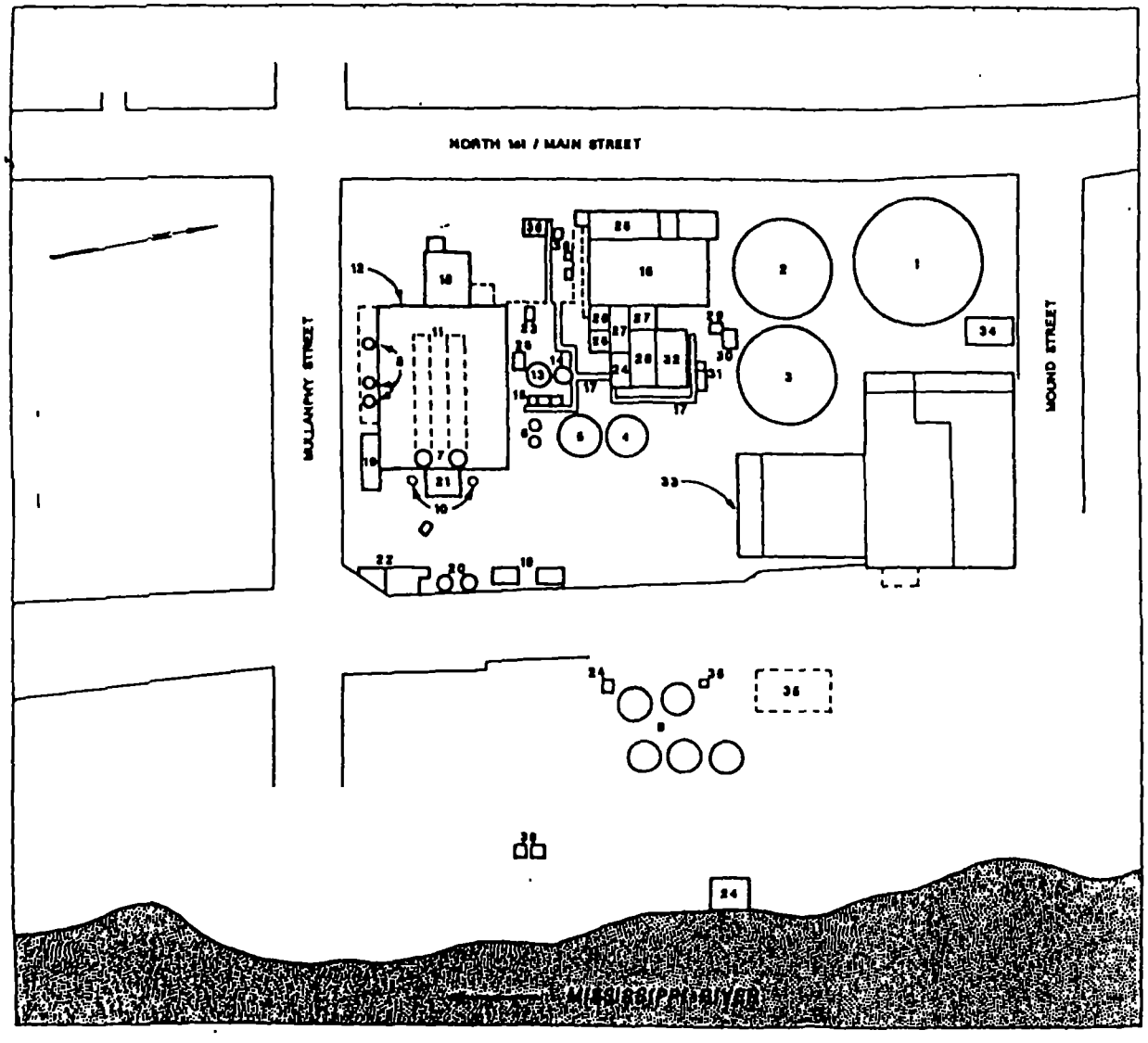
Mound Street PCB Site
St. Louis, Missouri

SVERDRUP

Site Map

Figure No.: 2

11/95



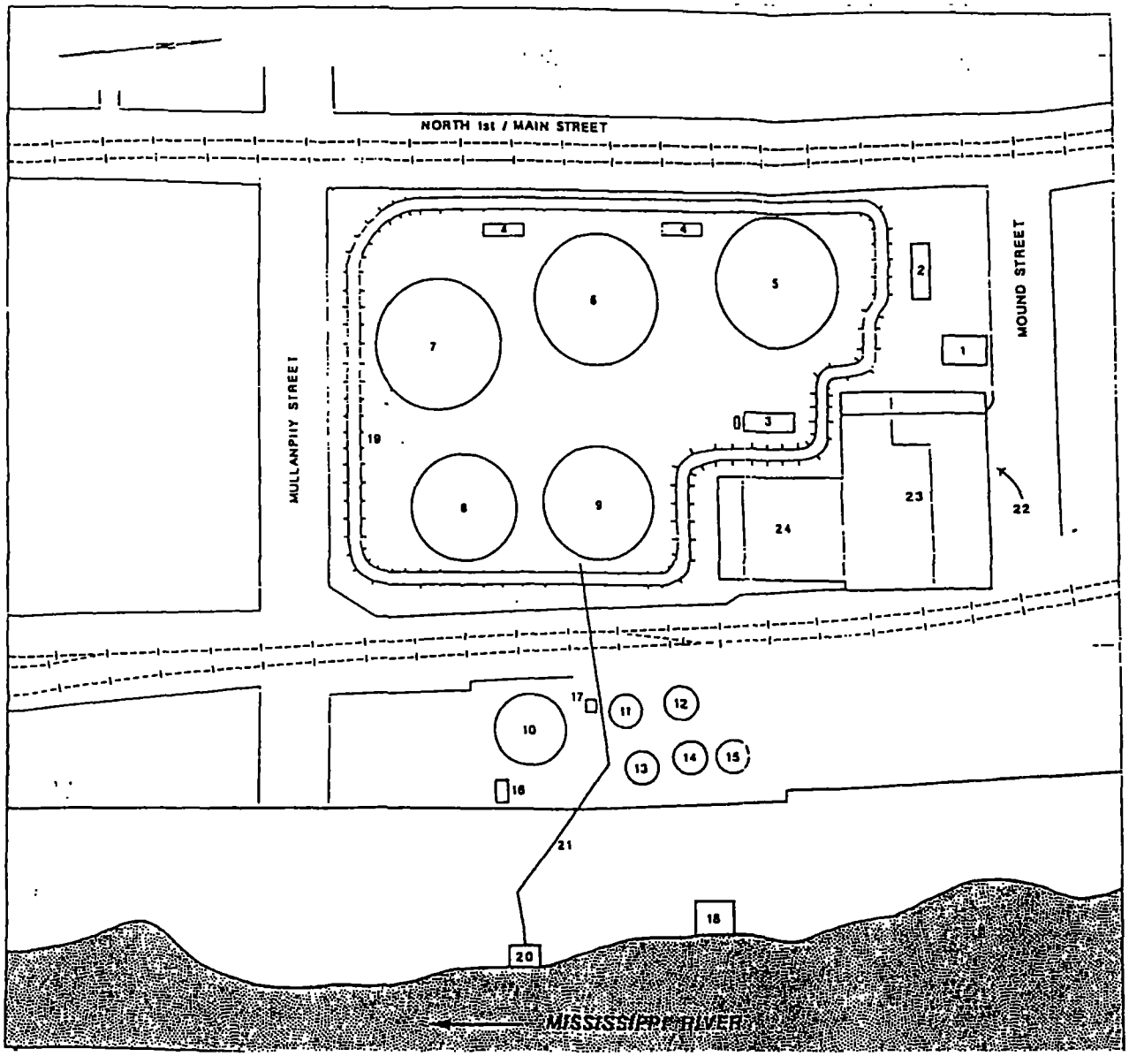
EXPLANATION

1. GAS HOLDER (787,927 Cubic Feet)
2. GAS HOLDER (666,431 Cubic Feet)
3. GAS HOLDER (337,368 Cubic Feet)
4. GAS PURIFIER (606 Cubic Yards)
5. GAS PURIFIER (606 Cubic Yards)
6. 2 - GAS SCRUBBERS (2,714 Cubic Feet Each)
7. 2 - TANKS, USE UNKNOWN (2,728 Cubic Feet Each)
8. 3 - TANKS, USE UNKNOWN (2,714 Cubic Feet Each)
9. 6 - FUEL OIL TANKS (150,726 Gallons Each)
10. 2 - RETORT SMOKE STACKS (80 Feet High And 8 Feet In Diameter Each)
11. 2 - BANKS OF RETORTS
12. RETORT HOUSE
13. AMMONIA WELL (56,111 Gallons)
14. AMMONIA WELL (22,626 Gallons)
15. TAR SEPARATOR (1,2244 Gallons)
16. PURIFIER HOUSE
17. PIPE TRENCHES (3 Feet Deep By 4 Feet Wide)
18. BLOWER HOUSE
19. GARAGE
20. TAR TANKS (53,644 Gallons Each)
21. STORAGE SHED
22. BLACKSMITH AND CARPENTER SHOP
23. STORAGE HOUSE
24. PUMP HOUSE
25. OFFICE AND METER ROOM
26. LABORATORY AND MACHINE SHOP
27. SCRUBBER HOUSE
28. CONDENSER HOUSE
29. GOVERNOR HOUSE
30. VALVE HOUSE
31. METER AND SWITCH HOUSE
32. EXHAUSTERS AND BLOWERS
33. LACLEDE ELECTRIC POWER FACILITY
34. OFFICE
35. TRANSFORMERS
36. UNKNOWN

MOUND STREET FACILITY
(LACLEDE GAS AND LIGHT CO.)
ST. LOUIS, MISSOURI
CIRCA 1900

SCALE
0 200
FEET

Source: E&E/FIT 1991. SSI Laclede Coal Gas Site, St. Louis, Missouri	Project No.: 010865-370303	Mound Street PCB Site St. Louis, Missouri SVERDRUP	Laclede Gas Coal Site circa 1900	Figure No.: 3 11/95



EXPLANATION

APEX OIL COMPANY
ST. LOUIS TERMINAL STRUCTURES

1. OFFICE
2. TANKER TRUCK LOADING PLATFORM
3. EQUIPMENT SHED
4. EQUIPMENT/WORK SHOP
5. FUEL OIL TANK (80,000 Barrels)
6. FUEL OIL TANK (80,000 Barrels)
7. FUEL OIL TANK (80,000 Barrels)
8. FUEL OIL TANK (50,000 Barrels)
9. FUEL OIL TANK (55,000 Barrels)
10. OIL TANK
11. CRUDE OIL TANK
12. CRUDE OIL TANK
13. CRUDE OIL TANK
14. CRUDE OIL TANK
15. CRUDE OIL TANK
16. PUMP HOUSE
17. PUMP HOUSE
18. PUMP HOUSE (Abandoned)
19. CONTAINMENT BERM
    (For Fuel Oil Tanks, Capped With A Chain-link Fence)
20. PUMP HOUSE
21. RIVER TANKER OFF-LOADING PIPES

FORMER UNION ELECTRIC
MOUND ST. FACILITY

22. FORMER UNION ELECTRIC BUILDING
23. GENERATOR ROOM (Basement Plan)
24. BOILER ROOM (Basement Plan)

LACLEDE COAL GAS SITE
ST. LOUIS, MISSOURI
(PRESENT DAY CONFIGURATION)

SCALE
0 200
FEET

Source: E&E/FIT 1991. SSI Laclede Coal Gas Site, St. Louis, Missouri

Project No.: 010865-370303

Mound Street PCB Site
St. Louis, Missouri

SVERDRUP

Apex Oil Terminal and Union Electric Sites circa 1990

Figure No.: 4

11/95

2.3 PREVIOUS INVESTIGATIONS

The Mound Street PCB Site has had numerous investigations conducted since 1976.

- The U.S. Coast Guard investigated oil slicks in the Mississippi River, in the vicinity of the Mound Street PCB Site, three times between 1976 to 1987. The oil slicks were reportedly originating from the Mound Street Power Plant. The basement of the Mound Street Power Plant was the suspected source of oil; however, no specific source was identified. No samples were collected during any of the Coast Guard investigations (References 3 and 4).

- The St. Louis City Division of Health conducted an investigation of the Mound Street Power Plant on April 8, 1987. Six oil samples were collected from the basement of the Mound Street building and analyzed for PCBs. No PCB contamination was identified; however, detection limits were not recorded (References 3 and 4).

- The Ecology and Environment/Field Investigation Team (E&E/FIT) submitted a PA report of the Mound Street Power Plant Site on June 23, 1988. The field activities were conducted on September 17, 1987. Six oil, water and oil/water mixture samples were collected from the Mound Street building basement and two from manholes in Mound Street during the PA site reconnaissance (Figure 5). The samples were analyzed for PCBs. No PCB contamination was detected at a 1 mg/kg detection limit in any of the samples. The source of oil in the basement of the Mound Street Power Plant building (Mound Street PCB Site) was potentially identified as the adjacent PFT-Apex Oil terminal. It was stated in the report that PFT-Apex Oil had numerous spills, some of which entered the Mound Street building basement. Transformers and hydraulic oil tanks, located in the Mound Street building basement, were supposedly drained and removed in the 1970s; however, no records confirming the proper disposal of oil were available.

- The E&E/FIT conducted a site reconnaissance of the Laclede Gas and Light FMGP on November 20, 1990 for the preparation of the SSI work plan. Seepage was observed emanating from the foundation and piping system of an abandoned pump house, formerly part of the Mound Street Power Plant. The pipes were reportedly plugged with concrete; however, seepage was leaching through the concrete. The pump house is located on the eastern side of the flood wall, therefore, the seepage was going directly into the Mississippi River. No samples were collected and no description of the seepage material was made during the site reconnaissance (Reference 3).

- The E&E/FIT submitted a SSI report on the Laclede Gas and Light FMGP Site on October 29, 1991. Field activities for the SSI occurred on March 3-9, 1991. Subsurface soil, surface soil, sediment, surface water and groundwater samples were collected on and around the PFT-Apex Oil property. No samples were collected from the basement of the Mound Street Power Plant Building (Mound Street PCB Site), as originally planned, since the building was being demolished at the time of the SSI field activities. Numerous samples were collected in the vicinity of the Mound Street PCB Site. Only these sample results will be discussed below. Five borehole screening locations, four surface soil sample locations, three groundwater sample locations, three surface water sample locations, and three sediment sample locations are in the vicinity of the Mound Street PCB Site (Figures 6a and 6b). Screening results indicated the presence of benzene, toluene, xylene and PAHs in the subsurface soil in the vicinity of the Mound Street PCB Site (borings B01, B02, B03, B17 and B18). Boring B23 was utilized as a background location, and the results showed nondetect for volatiles, metals, and semivolatiles. Screening values for surface

water samples were nondetect for the same parameters. Screening analysis of sediment samples indicated the presence of xylene and PAHs. Surface and near-surface soil samples submitted for CLP analysis were collected from the 0 - 2 foot depth interval. Samples were analyzed for semivolatiles, total metals and cyanide. Cyanide and PAHs were detected above the background detection limits. Metal concentrations were negligible when compared to background levels. Sediment samples submitted for CLP analysis were analyzed for total petroleum hydrocarbons, volatiles, semivolatiles, cyanide and total metals. The extreme upgradient sample (Sample 402) exhibited the highest concentrations; however, results are comparable between sediment sample locations. No background sediment sample was collected. Analytical results for the soil screening samples, sediment samples and surface soil samples are shown in Table 1.

Five groundwater samples were collected (Samples 201, 202, 203, 204 and 206) and analyzed for volatiles, semivolatiles, cyanide and total metals. Groundwater sample analysis showed 65 ug/L acenapthalene, 25 ug/L fluorene, 46 ug/L phenanthene, 93 ug/L benzene and 1600 ug/L cyanide in Well 204. Well 203 sample analysis did not show any contamination except for 590 ug/L cyanide. Both cyanide results are "J" coded, the value is reported but not valid under approved QC procedures. Well 206 (background) did not show any contamination above detection limits.

Arsenic, barium, copper, chromium, nickel, selenium, vanadium, and zinc were not detected in four surface water samples (Samples 301, 302, 303 and 304), except as indicated. Surface water sample analysis showed lead levels at 7.0 ug/L for 301, 7.2ug/L for 301D, 9.7 ug/L for 302, <24 ug/L for 303, 18 ug/L for 304, and 15ug/L for 304D. Sample location 303 also showed barium at 280 ug/L, vanadium at 62 ug/L, zinc at <89 ug/L and an invalid selenium result of 11 ug/L. Sample location 304 and 304D showed chromium at 14 ug/L and 12 ug/L, respectively. Sample location 304 also had a result of 54 ug/L for zinc. Sample 304 was collected from the Illinois-American Water Company surface intake located across the Mississippi River from the site. Sample locations are shown in Figure 6. Surface water samples were analyzed for total petroleum hydrocarbons, volatiles, semivolatiles, cyanide and total metals. None of the samples collected during the Laclede Coal Gas SSI were analyzed for PCBs.

In the E&E/FIT SSI report, it is stated that a mixed source is present since BETX compounds "are not considered abundant in coal tar." The PAHs and cyanide were attributed to the former coal gas operations. It was also stated that some PAH contamination may be attributed to the adjacent PFT-Apex Facility, which stores oil and asphalt.

- On July 8, 1993 St. Louis MSD personnel discovered oil seeping into the Brooklyn Street storm water pump station, located at the eastern end of Brooklyn Street and approximately 400 feet north of the Mound Street PCB Site (Reference 7). This pump station is only operational during heavy precipitation or if the Mississippi River level is above flood stage. In July, 1993, the Mississippi River was above flood stage. A waste oil sample from the pump station wet well was collected and analyzed for PCBs by the MSD. A PCB concentration of 47 mg/L was detected (Reference 12). The possible source was identified as an underground storage tank (UST) on the adjacent property (Reference 19). On August 9, 1993, waste oil samples from three manholes located along the flood wall were collected and analyzed for PCBs by the MSD. These three manholes are part of the underdrain system for the flood wall and are not part of the storm sewer system. The concentrations of PCBs were 25.4 mg/L in Manhole F-GA1 (#12), 11.7 mg/L in Manhole F-GA1 (#13), 36.6 mg/L in Manhole F-GA1 (#14) (Reference 13). Five 55-gallon drums of waste oil were pumped out of the storm sewer by REACT Environmental Engineers and disposed of by

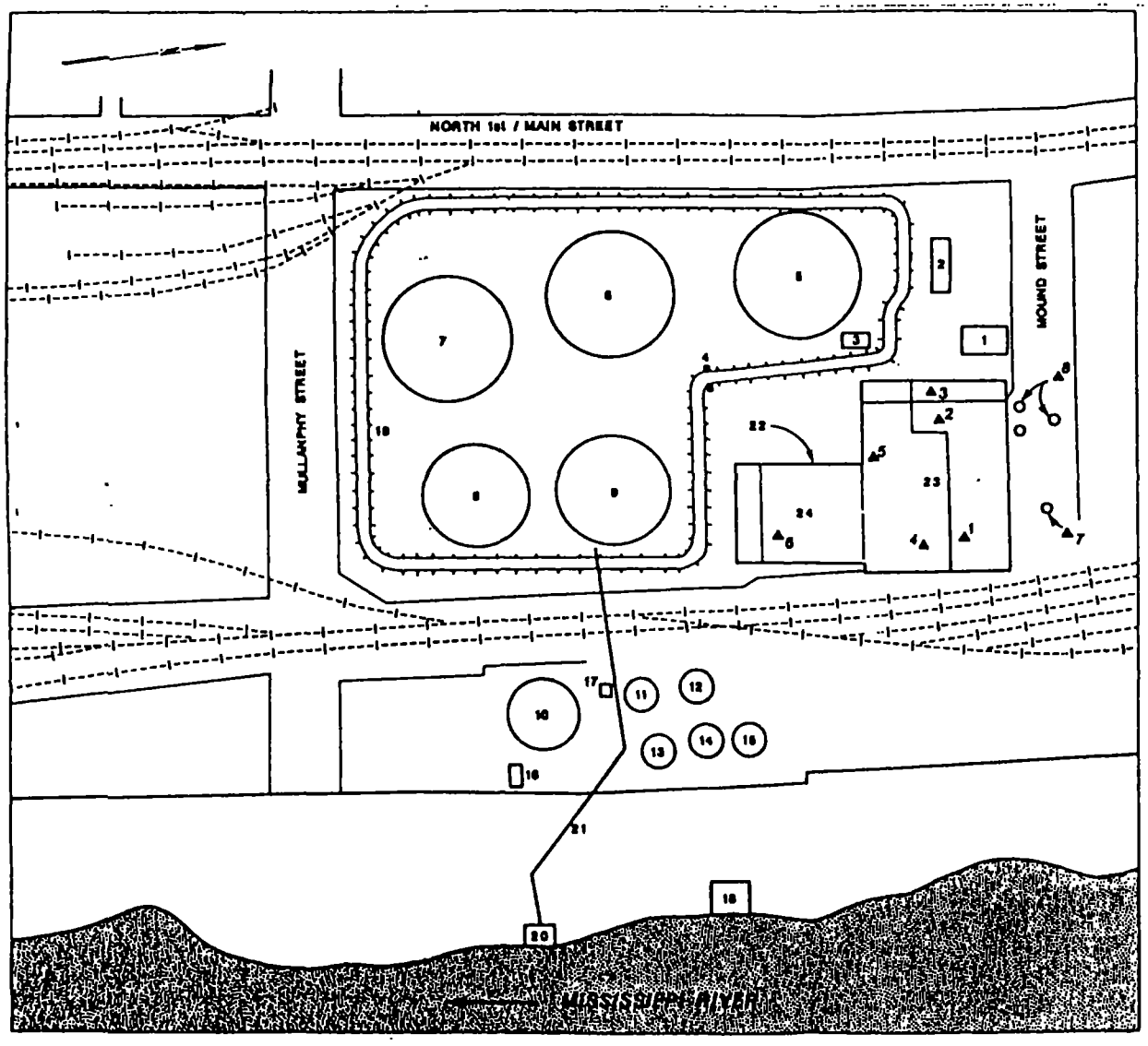
Tipton Environmental Services (References 5 and 7). In the conclusion of the Special Problem Investigation report completed by MSD, it is stated the UST appears to be the source of the oil in the pump station. It is further stated that ground saturation of oil from an old Union Electric facility is another possibility (Reference 19).

A 12,000-gallon UST (10.5 foot diameter by 18.5 feet long) containing petroleum products was discovered during an investigation to identify the potential source of the PCBs in the pump station (Reference 9). The UST was located on Terminal Railroad Association (TRRA) property, southwest of the Brooklyn Street pump station (Figure 7). The TRRA property is located on the north side of Mound Street, directly across from the Mound Street PCB Site (Appendix A, Photo 5). A sample was collected from the UST on July 14, 1993 by MSD. Sample analysis showed PCBs in the UST at 39 mg/L (Reference 12). The existence of the UST was unknown to TRRA prior to notification by the St. Louis Fire Marshall. The tank contents were removed on August 4, 1993 by Environmental Operations, under supervision by GEHM Corporation. Sixteen 55-gallon drums of sludge/liquid were removed from the UST. Sample analysis of the tank contents showed PCBs at less than 10 mg/kg (Reference 9). Analysis of soil samples collected from the UST excavation showed PCBs at less than 0.05 mg/kg (Reference 10). Approximately 30 cubic yards of soil were removed during excavation of a 16 foot wide, 25 foot long and 12 foot deep UST pit. It is estimated that less than 50 gallons of water was in the UST pit after excavation activities (Reference 10); however, no sample of the water was collected. On August 17, 1993 EnTech Engineering, under supervision by GEHM Corporation, conducted an Infrared Thermograph (IR/T) survey of the TRRA Site. No evidence of a leak plume was identified during this study. An anomaly was discovered, approximately 10 foot square, on the Mound Street PCB property. Boreholes were attempted at the location of the anomaly; however, they were abandoned after auger refusal at a depth of 5 feet due to encountering solid rock debris (Reference 9). The foundation or basement of the demolished Mound Street Site buildings could explain the presence of the IR/T anomaly (Reference 7).

A letter from Randel Lewis, Terminal Manager for the Petroleum Fuel and Terminal Facility, to Charles Gay, St. Louis City Fire Inspector, was written in response to a September 8, 1993 telephone conversation. In the letter, Mr. Lewis stated that a leak in a 6-inch pipeline was discovered at the facility. Repairs to the pipeline were made with approximately 2.5 barrels of oil/soil being disposed of. It was further stated that the pipeline was taken out-of-service. The letter does not indicate where the pipeline was located.

- The Missouri Department of Natural Resources (MDNR) submitted a PA report on the Mound Street PCB Site on March 21, 1994. Field activities for the PA occurred on November 11, 1993. No samples were collected during the PA. The conclusions of the PA report indicate that a threat from the groundwater pathway is very unlikely, a release to the Mississippi River appears likely, an exposure through the soil pathway is low and an exposure through the air pathway is also low.

No further incidences of oil in the Brooklyn Street pump station or manholes along the flood wall have occurred since the 1993 spill (Reference 6).



EXPLANATION

APEX OIL COMPANY
ST. LOUIS TERMINAL STRUCTURES

1. OFFICE
2. TANKER TRUCK LOADING PLATFORM
3. EQUIPMENT SHED
4. ENCLOSURE DRAIN PIPE
5. FUEL OIL TANK (80,000 Barrels)
6. FUEL OIL TANK (80,000 Barrels)
7. FUEL OIL TANK (80,000 Barrels)
8. FUEL OIL TANK (80,000 Barrels)
9. FUEL OIL TANK (55,000 Barrels)
10. OIL TANK
11. CRUDE OIL TANK
12. CRUDE OIL TANK
13. CRUDE OIL TANK
14. CRUDE OIL TANK
15. CRUDE OIL TANK
16. PUMP HOUSE
17. PUMP HOUSE
18. PUMP HOUSE (Abandoned)
19. CONTAINMENT BERM
(For Fuel Oil Tanks, Capped With A Chain-link Fence)
20. PUMP HOUSE
21. RIVER TANKER OFF-LOADING PIPES

FORMER UNION ELECTRIC
MOUND ST. FACILITY
(Currently Owned By Mound St. Corp.)

22. FORMER UNION ELECTRIC BUILDING
23. GENERATOR ROOM (Basement Plan)
24. BOILER ROOM (Basement Plan)

O STORM SEWER LID

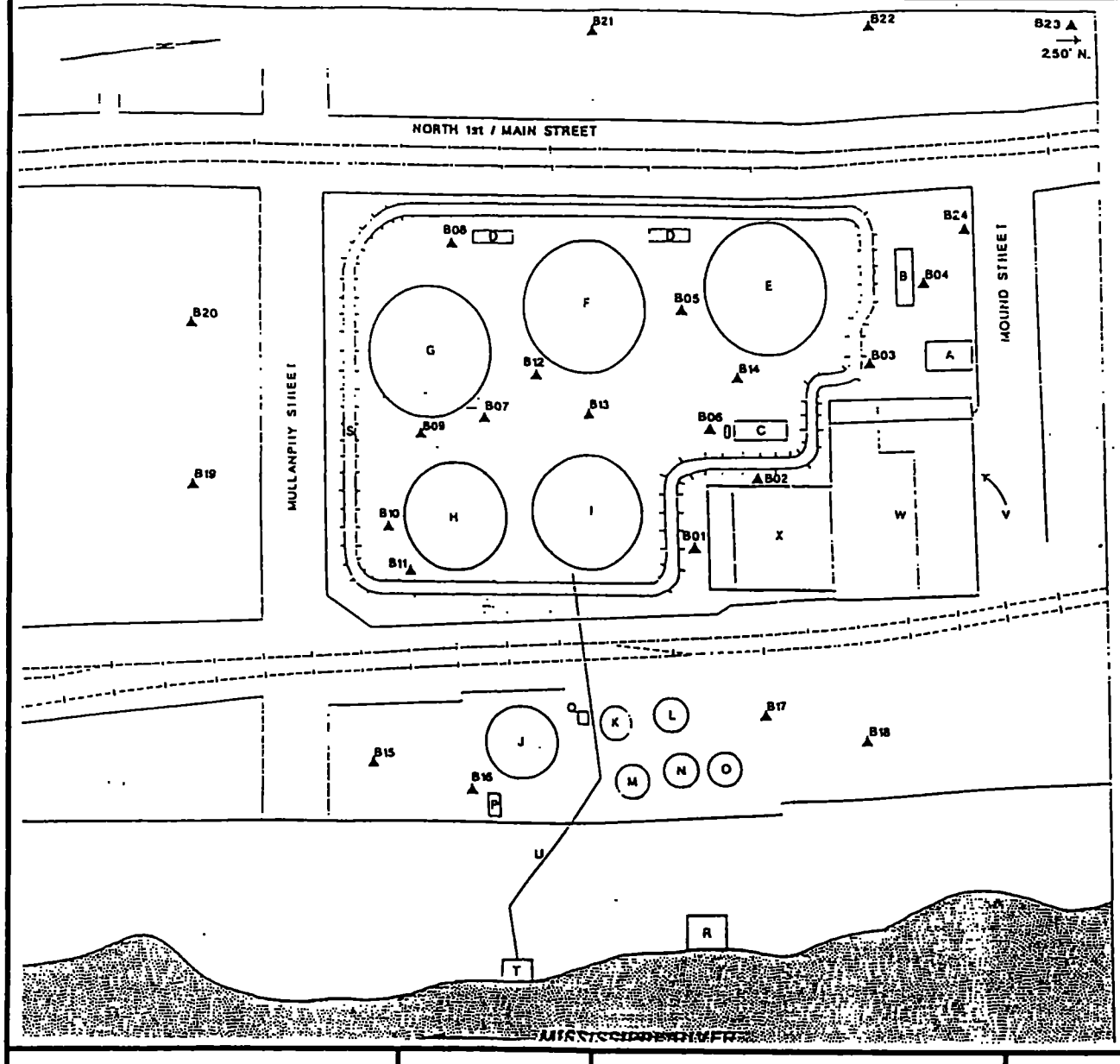
$\blacktriangle^2$ SAMPLE LOCATION AND IDENTIFICATION

MOUND STREET FACILITY
ST. LOUIS, MISSOURI
(PRESENT DAY CONFIGURATION)

FIGURE 2-2

SCALE
0 200
FEET

Source: E&E/FIT 1988. PA Mound Street Power Plant Site, St. Louis, Missouri	Project No.: 010865-370303	Mound Street PCB Site St. Louis, Missouri	Mound Street Power Plant PA Sample Location Map	Figure No.: 5
		SVERDRUP		11/95



EXPLANATION

APEX OIL COMPANY
ST. LOUIS TERMINAL STRUCTURES

- A. OFFICE
- B. TANKER TRUCK LOADING PLATFORM
- C. EQUIPMENT SHED
- D. EQUIPMENT/WORK SHOP
- E. FUEL OIL TANK (80,000 Barrels)
- F. FUEL OIL TANK (80,000 Barrels)
- G. FUEL OIL TANK (80,000 Barrels)
- H. FUEL OIL TANK (50,000 Barrels)
- I. FUEL OIL TANK (55,000 Barrels)
- J. OIL TANK
- K. CRUDE OIL TANK
- L. CRUDE OIL TANK
- M. CRUDE OIL TANK
- N. CRUDE OIL TANK
- O. CRUDE OIL TANK
- P. PUMP HOUSE
- Q. PUMP HOUSE
- R. PUMP HOUSE (Abandoned)
- S. CONTAINMENT BERM (For Fuel Oil Tanks, Capped With A Chain-link Fence)
- T. PUMP HOUSE
- U. RIVER TANKER OFF-LOADING PIPES

FORMER UNION ELECTRIC
MOUND ST. FACILITY

- V. FORMER UNION ELECTRIC BUILDING
- W. GENERATOR ROOM (Basement Plan)
- X. BOILER ROOM (Basement Plan)

B01 ▲ BORE HOLE (SCREENING) SAMPLE LOCATION

LACLEDE COAL GAS SITE
ST. LOUIS, MISSOURI
(PRESENT DAY CONFIGURATION)

SCALE
0 200
FEET

Source: E&E/FIT 1991. SSI Laclede Coal Gas Site, St. Louis, Missouri

Project No.: 010865-370303

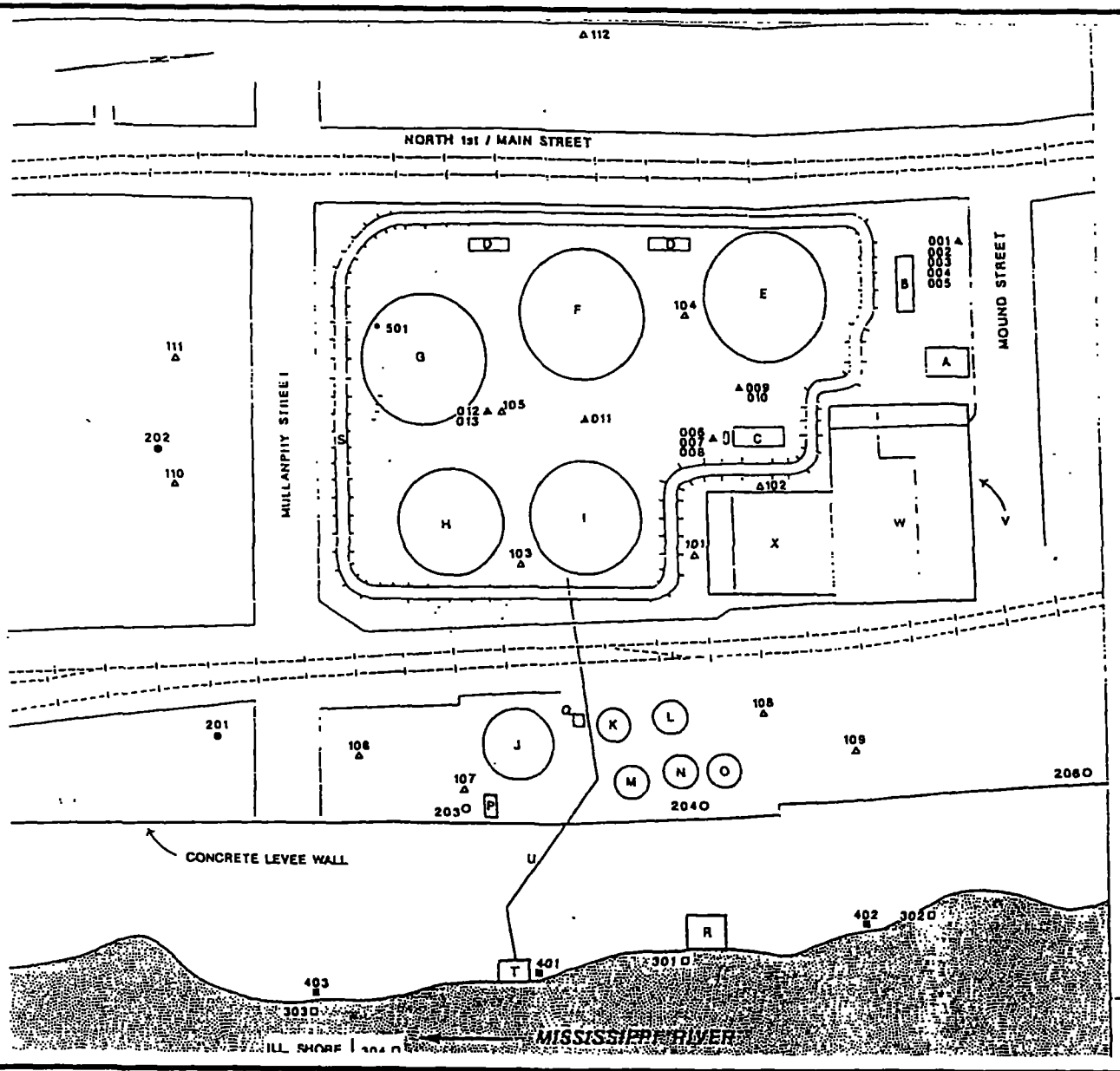
Mound Street PCB Site
St. Louis, Missouri

SVERDRUP

Laclede Coal Gas SSI
Screening Borehole
Sample Location Map

Figure No.: 6a

11/95



EXPLANATION

APEX OIL COMPANY
ST. LOUIS TERMINAL STRUCTURES

- A. OFFICE
- B. TANKER TRUCK LOADING PLATFORM
- C. EQUIPMENT SHED
- D. EQUIPMENT/WORK SHOP
- E. FUEL OIL TANK (80,000 Barrels)
- F. FUEL OIL TANK (80,000 Barrels)
- G. FUEL OIL TANK (80,000 Barrels)
- H. FUEL OIL TANK (50,000 Barrels)
- I. FUEL OIL TANK (55,000 Barrels)
- J. OIL TANK
- K. CRUDE OIL TANK
- L. CRUDE OIL TANK
- M. CRUDE OIL TANK
- N. CRUDE OIL TANK
- O. CRUDE OIL TANK
- P. PUMP HOUSE
- Q. PUMP HOUSE
- R. PUMP HOUSE (Abandoned)
- S. CONTAINMENT BERM (For Fuel Oil Tanks, Capped With A Chain-link Fence)
- T. PUMP HOUSE
- U. RIVER TANKER OFF-LOADING PIPES

FORMER UNION ELECTRIC
MOUND ST. FACILITY

- V. FORMER UNION ELECTRIC BUILDING
- W. GENERATOR ROOM (Basement Plan)
- X. BOILER ROOM (Basement Plan)

- ▲ SUBSURFACE SOIL SAMPLE LOCATION
- △ SURFACE SOIL SAMPLE LOCATION
- ● MINI WELL SAMPLE LOCATION
- ○ PIEZOMETER WELL SAMPLE LOCATION
- □ SURFACE WATER SAMPLE LOCATION
- ■ SEDIMENT SAMPLE LOCATION
- • HIGH CONCENTRATION OIL SAMPLE LOCATION

LACLEDE COAL GAS SITE
ST. LOUIS, MISSOURI
(PRESENT DAY CONFIGURATION)

SAMPLE SERIES # DSX44
SAMPLING DATES: MAR. 4-9, 1991

SCALE
0 200
FEET

Source: E&E/FIT 1991. SSI Laclede Coal Gas Site, St. Louis, Missouri

Project No.: 010865-370303

Mound Street PCB Site
St. Louis, Missouri

SVERDRUP

Laclede Coal Gas SSI
Soil, Sediment, Groundwater and Surface Water Sample Location Map

Figure No.: 6b

11/95

Table 1
Sample Analysis Results
1991 Laclede Coal Gas Site SSI
St. Louis, Missouri

Sample No. (Refer to Figure 6a)	Benzene (ug/kg)	Toluene (ug/kg)	Xylene (ug/kg)	Fluor anthene (ug/kg)	Pyrene (ug/kg)	Benzo(k) fluor anthene (ug/kg)	Benzo(a) pyrene (ug/kg)	Comments
Field Analytical Support Program – Mobile Laboratory Screening Results								
B01 (borehole soil sample)	1,200	380	1,700	16,000	3,700	NT[A]	NT	0-5 ft sample depth, same location as surface soil sample 101
B01 (borehole soil sample)	9,100	1,200	19,000	27,000	12,000	NT	NT	5-10 ft sample depth, same location as surface soil sample 101
B01 (borehole soil sample)	18,000	710	65,000	56,000	40,000	NT	NT	10-15 ft sample depth, same location as surface soil sample 101
B01 (borehole soil sample)	17,000	770	79,000	13,000	5,200	NT	NT	15-18 ft sample depth, same location as surface soil sample 101
B02 (borehole soil sample)	6,300	43,000	240,000	8,000	<500	<500	<500	0-5 ft sample depth, same location as surface soil sample 102
B02 (borehole soil sample)	6,100	1,700	57,000	15,000	ND[B]	ND	ND	5-10 ft sample depth, same location as surface soil sample 102
B02 (borehole soil sample)	69,000	110,000	570,000	ND	ND	ND	ND	10-15 ft sample depth, same location as surface soil sample 102
B02 (borehole soil sample)	7,500	650	33,000	ND	ND	ND	ND	15-21 ft sample depth, same location as surface soil sample 102
B03 (borehole soil sample)	1,040	22,000	22,000	<500	<500	<500	<500	0-5 ft sample depth

Table 1
Sample Analysis Results
1991 Laclede Coal Gas Site SSI
St. Louis, Missouri

Sample No. (Refer to Figure 6a)	Benzene (ug/kg)	Toluene (ug/kg)	Xylene (ug/kg)	Fluor anthene (ug/kg)	Pyrene (ug/kg)	Benzo(k) fluor anthene (ug/kg)	Benzo(a) pyrene (ug/kg)	Comments
Field Analytical Support Program -- Mobile Laboratory Screening Results								
B01 (borehole soil sample)	1,200	380	1,700	16,000	3,700	NT[A]	NT	0-5 ft sample depth, same location as surface soil sample 101
B01 (borehole soil sample)	9,100	1,200	19,000	27,000	12,000	NT	NT	5-10 ft sample depth, same location as surface soil sample 101
B01 (borehole soil sample)	18,000	710	65,000	56,000	40,000	NT	NT	10-15 ft sample depth, same location as surface soil sample 101
B01 (borehole soil sample)	17,000	770	79,000	13,000	5,200	NT	NT	15-18 ft sample depth, same location as surface soil sample 101
B02 (borehole soil sample)	6,300	43,000	240,000	8,000	<500	<500	<500	0-5 ft sample depth, same location as surface soil sample 102
B02 (borehole soil sample)	6,100	1,700	57,000	15,000	ND[B]	ND	ND	5-10 ft sample depth, same location as surface soil sample 102
B02 (borehole soil sample)	69,000	110,000	570,000	ND	ND	ND	ND	10-15 ft sample depth, same location as surface soil sample 102
B02 (borehole soil sample)	7,500	650	33,000	ND	ND	ND	ND	15-21 ft sample depth, same location as surface soil sample 102
B03 (borehole soil sample)	1,040	22,000	22,000	<500	<500	<500	<500	0-5 ft sample depth

Table 1
Sample Analysis Results
1991 Laclede Coal Gas Site SSI
St. Louis, Missouri
(continued)

Sample No.	Benzene (ug/kg)	Toluene (ug/kg)	Xylene (ug/kg)	Fluor anthene (ug/kg)	Pyrene (ug/kg)	Benzo(k) fluor anthene (ug/kg)	Benzo(a) pyrene (ug/kg)	Comments
Field Analytical Support Program -- Mobile Laboratory Screening Results								
302 (surface water sample)	<25	<25	<25	NT	NT	NT	NT	Surface water sample
303 (surface water sample)	<25	<25	<25	NT	NT	NT	NT	Surface water sample

Sample No. (Refer to Figure 6b)	Pyrene (mg/kg)	Benzo(k) fluor anthene (mg/kg)	Benzo(a) pyrene (mg/kg)	Benzo(b) fluor anthene (mg/kg)	Benzo(a) anthracene (mg/kg)	Chrysene (mg/kg)	Total PAHs (mg/kg)	Cyanide (mg/kg)	Comments
Surface Soil Samples -- CLP Analysis									
101 (B01)	ND[B]	ND	ND	ND	ND	ND	ND	33	0-2 ft sample depth
102 (B02)	21	ND	ND	ND	ND	ND	21	ND	0-2 ft sample depth
107 (B16)	ND	ND	ND	ND	ND	ND	73[E]	14	0-2 ft sample depth
108 (B17)	ND	ND	ND	ND	ND	ND	9.8[F]	98	0-2 ft sample depth
109 (B18)	6.7	3.4	4.2	4.9	4.5	4.3	40[G]	35	0-2 ft sample depth
112 (B21, background sample)	1.4	0.68	0.7	0.61	0.79	0.85	6.8[H]	<6.7	0-2 ft sample depth, background soil sample

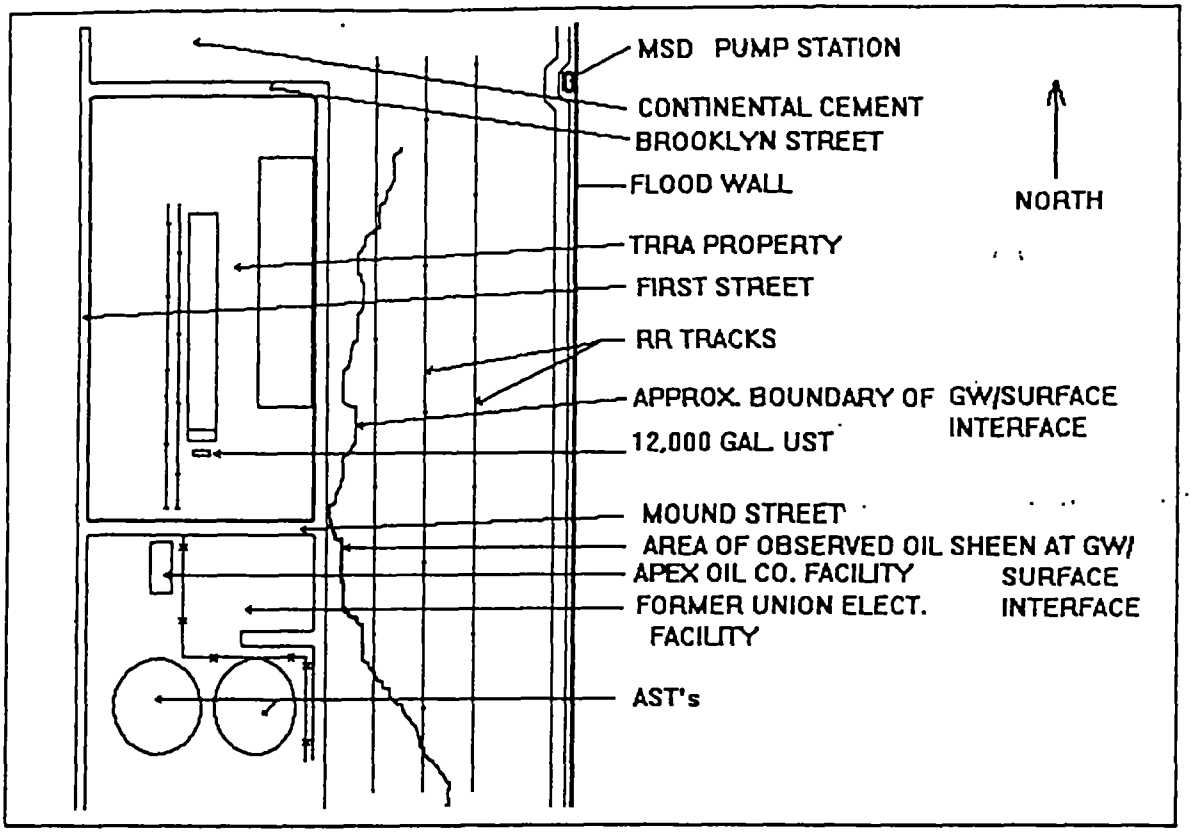
Table 1
Sample Analysis Results
1991 Laclede Coal Gas Site SSI
St. Louis, Missouri
(continued)

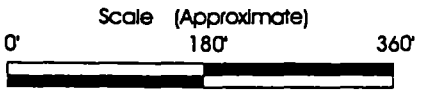
Sample No. (Refer to Figure 6b)	Pyrene (ug/kg)	Benzo(k) fluor anthene (ug/kg)	Benzo(a) pyrene (ug/kg)	Benzo(a) anthracene (ug/kg)	Benzo(ghi) perylene (ug/kg)	Phen anthene (ug/kg)	Fluor anthene (ug/kg)	Di-n-octyl phthalate (ug/kg)	Cyanide (ug/kg)	Total Hydro carbons (ug/kg)
Sediment Samples -- CLP Analysis										
401	ND/960[C]	ND/ND[C]	ND/430[C]	ND/460[C]	ND/ND[C]	ND/ND[C]	ND/750[C]	ND/470[C]	ND/ND[C]	3,100/ <3,100[C]
402	8,000	2,900	2,600	3,500	3,500	2,900	5,000	3,900	1,600	8,200
403	6,400J[D]	3,100	5,600	4,200	4,100	4,400	5,100	4,900	ND	4,900

	Arsenic (mg/kg)	Barium (mg/kg)	Copper (mg/kg)	Chromium (mg/kg)	Nickel (mg/kg)	Lead (mg/kg)	Selenium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
401	3.7/4.0[C]	140/140[C]	9.1/8.2[C]	8.7/9.0[C]	10/11[C]	30J/13J[C,D]	ND/ND[C]	15/17[C]	35J/36J[C,D]
402	8.4	160	26	16	18	36J[D]	2.0J[D]	27	77J[D]
403	7.1	160	23	12	16	31J[D]	ND	25	64J[D]

A NT = Not Tested.
B ND = Non detected.
C Sample results/duplicate results.
D J = Results reported but are invalid by approved QC procedures.
E 60 mg/kg naphthalene and 13 mg/kg 2-methylnaphthalene detected.
F 1.1 mg/kg naphthalene, 2.5 mg/kg 2-methylnaphthalene, 2.4 mg/kg acenaphthylene, 0.69 mg/kg acenaphthene, and 3.1 mg/kg fluorene detected.
G 0.51 mg/kg naphthalene, 0.46 mg/kg acenaphthylene, 2.2 mg/kg phenanthrene, 0.78 mg/kg anthracene, 2.8 mg/kg fluoranthene, 2.7 mg/kg ideno(1,2,3-cd)pyrene, and 2.6 mg/kg dibenzo(g,h,i)perylene detected.
H 0.44 mg/kg phenanthene, 1.3 mg/kg fluoranthene, and below detection limit of 0.41 mg/kg for remaining PAHs.

Source: Reference 3.





Source: GEHM 1993. Activities Report, TRRA of St. Louis, First and Mound Streets Site, MDNR Spill Report #07143-KB-1331

Project No.: 010865-370303	Mound Street PCB Site St. Louis, Missouri	TRRA UST Location Map	Figure No.: 7
	SVERDRUP		11/95

2.4 WASTE CHARACTERISTICS

The contaminants of concern at the Mound Street PCB Site originate from at least two separate sources; 1) coal gas operations, and 2) electrical power generation and transmission operations. The former is a source for coal tar wastes and spent oxides, while the latter is a potential source for PCBs. Coal tar wastes include polynuclear aromatic hydrocarbons (PAHs) and phenolic compounds resulting from combustion processes, and spent iron oxides resulting from gas purification processes. Benzene, ethylbenzene, toluene and xylene are possible constituents of coal tar wastes. Iron oxides may contain sulphur, cyanide and small quantities of coal tar. PCBs are found in transformer and hydraulic oil. It is estimated that approximately 223,680,000 gallons of coal tar wastes may be buried on the former Laclede Coal Gas Site, which includes the Mound Street PCB Site (Reference 3). The quantity, if any, of PCB contaminated oil in the subsurface is not known.

2.5 CLIMATE AND DEMOGRAPHY

The St. Louis climate is characterized as having cold winters and long hot summers (Reference 26). Rainfall is fairly heavy and generally well distributed throughout the year at this site. Heavier rains occur in the spring and early summer. Snow falls nearly every winter, but complete cover is limited to only a few days per snowfall event. Total normal annual precipitation from all sources is about 36 inches (Reference 28). The prevailing wind is from the south (Reference 26).

The population within a 4-mile radius of the site is estimated at approximately 207,100 persons (Reference 3), with approximately 3,755 persons within a 1-mile radius on the Missouri side of the river (Reference 15).

2.6 TOPOGRAPHY AND DRAINAGE

The site is essentially flat, with a gentle slope to the east and south (Appendix A, Photo 6). A 500-year concrete flood wall was constructed by the Corps of Engineers and separates the site from the Mississippi River. The runoff from the site is collected in the storm sewer. The storm sewer is connected to the sanitary sewer system, with the wastewater flowing to the Bissle Point Treatment Plant located approximately 2.5 miles upstream (Reference 3).

3.0 SCREENING SITE INSPECTION WASTE AND SOURCE SAMPLING

3.1 SCREENING SITE INSPECTION (SSI)

Screening Site Inspection (SSI) field activities were conducted by Sverdrup personnel during the week of April 1, 1996. During the SSI scoping meeting, held on December 20, 1995, it was determined that the field activities would focus on obtaining data on PCB contamination at the site and the possible migration of contamination to the Mississippi River. Previous investigations have only focused on the FMGP source contamination. The sampling activities would include collection of groundwater samples from two existing monitoring wells, collection of subsurface soil samples to determine levels of contamination in the subsurface, and collection of appropriate QA/QC samples.

In order to demonstrate a release, sample locations must be chosen to demonstrate that the hazardous substance is present at levels significantly above the known background concentrations. Groundwater, soil, surface water and sediment sample data collected to date have all been analyzed for volatiles, semi-volatiles, cyanide and metals. Samples were collected from areas impacted by FMGP activities and background locations. Background is the ambient concentration of a hazardous substance and includes naturally occurring concentrations, concentrations from man-made sources other than the site being evaluated, and concentrations from the site. Generally, background levels are best supported by chemical analysis. The focus of the soil sampling activity was to obtain chemical data concerning contaminant concentrations in the soil.

The SSI field activities were conducted on April 2 - 3, 1996. Personnel involved in the SSI, their affiliation, and project responsibility, are as follows:

Pete Culver, U.S. EPA, Work Assignment Manager
Dave Crawford, U.S. EPA, Site Assessment Manager, Missouri
Herman Gellman, McKinley Iron, President
Tim Bishop, Petroleum, Fuel and Terminal, Facility Manager
Michael McCurdy, Sverdrup (EPA ARCS Contractor), Site Manager
Michael May, Sverdrup (EPA ARCS Contractor), Field Geologist
Randy Schademann, Ecology & Environment (EPA Contractor), Geoprobe™ Operator
Scott Hayes, Ecology & Environment (EPA Contractor), Field Technician
Andy Mazzeo, Ecology & Environment (EPA Contractor), Field Technician

3.2 SOURCE AREAS

The contaminants of concern at the Mound Street PCB Site originate from at least two separate sources; 1) coal gas operations, and 2) electrical power generation and transmission operations. The former is a source for coal tar wastes and spent oxides, while the latter is a potential source for PCBs. Coal tar wastes include PAHs and phenolic compounds resulting from combustion processes, and spent iron oxides resulting from gas purification processes. Benzene, ethylbenzene, toluene and xylene are possible constituents of coal tar wastes. Iron oxides may contain sulphur, cyanide and small quantities of coal tar. PCBs may be found in transformer and hydraulic oil.

Previous site industrial activities dictate the presence of oils; however, there is no documentation showing PCBs originating from the site. The exact source of the PCB contamination is unknown at this time.

3.3 SVERDRUP SSI SAMPLE LOCATIONS

Groundwater samples were collected from two existing monitoring wells installed by unknown parties on the adjacent PFT-Apex Oil Facility. Sample DC1CY-001/001D was collected from the South Well (Appendix A, Photo 7) and sample DC1CY-002 was collected from the North Well (Appendix A, Photo 8). These two wells are located between the potential source of PCB contamination (Mound Street Site) and the Mississippi River (Figure 8a). A summary of the samples collected is included in Table 2.

Subsurface soil samples were collected in the area of the former Mound Street building, and between the former building local and the Mississippi River (Figure 8b). Sample DC1CY-101 was collected near the southeastern corner of the former building local (Appendix A, Photo 9), with the intent of providing an impacted soil sample. Samples DC1CY-100/100D, DC1CY-102, DC1CY-103 and DC1CY-104 were collected between the former building local and the concrete flood wall (Appendix A, Photos 10 and 11). Samples DC1CY-102 and DC1CY-103 were collected in the same boring at depths of 18 to 20 feet and 25 to 27 feet, respectively. A summary of the samples collected is included in Table 2.

No surface water or sediment samples were collected and no air samples were collected as part of this investigation.

3.4 SSI SAMPLING RESULTS

A total of three groundwater samples, six soil samples, one aqueous rinsate sample, one water field blank, one water trip blank, and one soil trip blank were delivered to the Region VII EPA Laboratory on April 4, 1996. Samples were analyzed under activity number DC1CY. Lab analyses included the following methods:

VOCs: Water samples by Media-Group-Parameter (MGP) WV (water volatiles) and soil sample by MGP SV (soil volatiles)

Semi-VOCs: Water samples by MGP WS (water semivolatiles) and soil sample by MGP SS (soil semivolatiles)

PCBs: Water samples by MGP W24 (PCB - G. Beemont) and soil samples by MGP S16 (PCB - G. Beemont)

All samples were prepared as required, with appropriate acid preservatives added to the water sample, placed on ice, and a Field Chain of Custody was maintained according to EPA SOP 2130.2A, "Field Chain of Custody for Environmental Samples," May 1989.

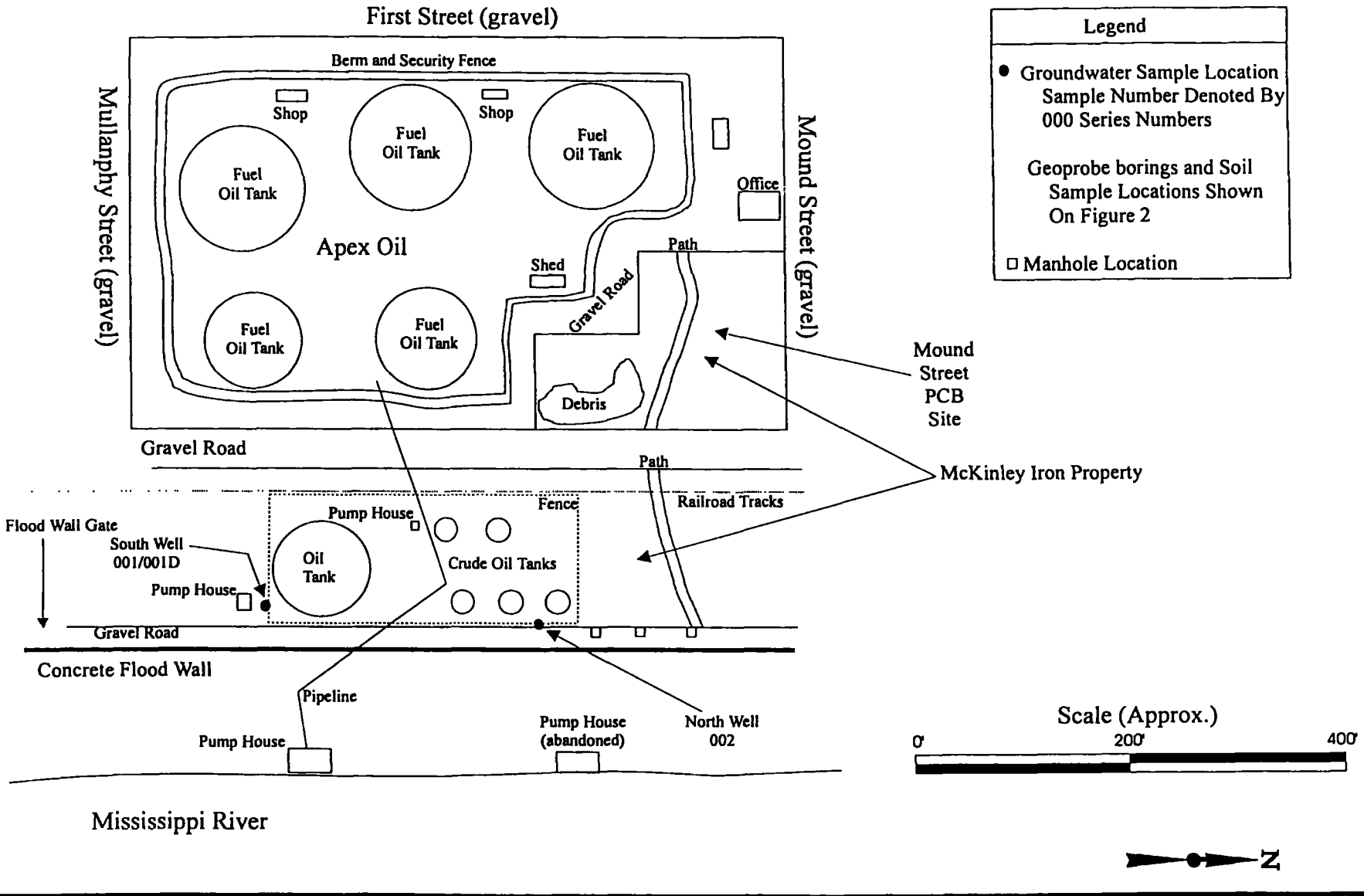
The SSI sampling data was validated by the Region VII EPA Laboratory.

Table 2
Sample Summary
Mound Street PCB Site
St. Louis, Missouri
Sample Series DC1CY
April 2 - 3, 1996

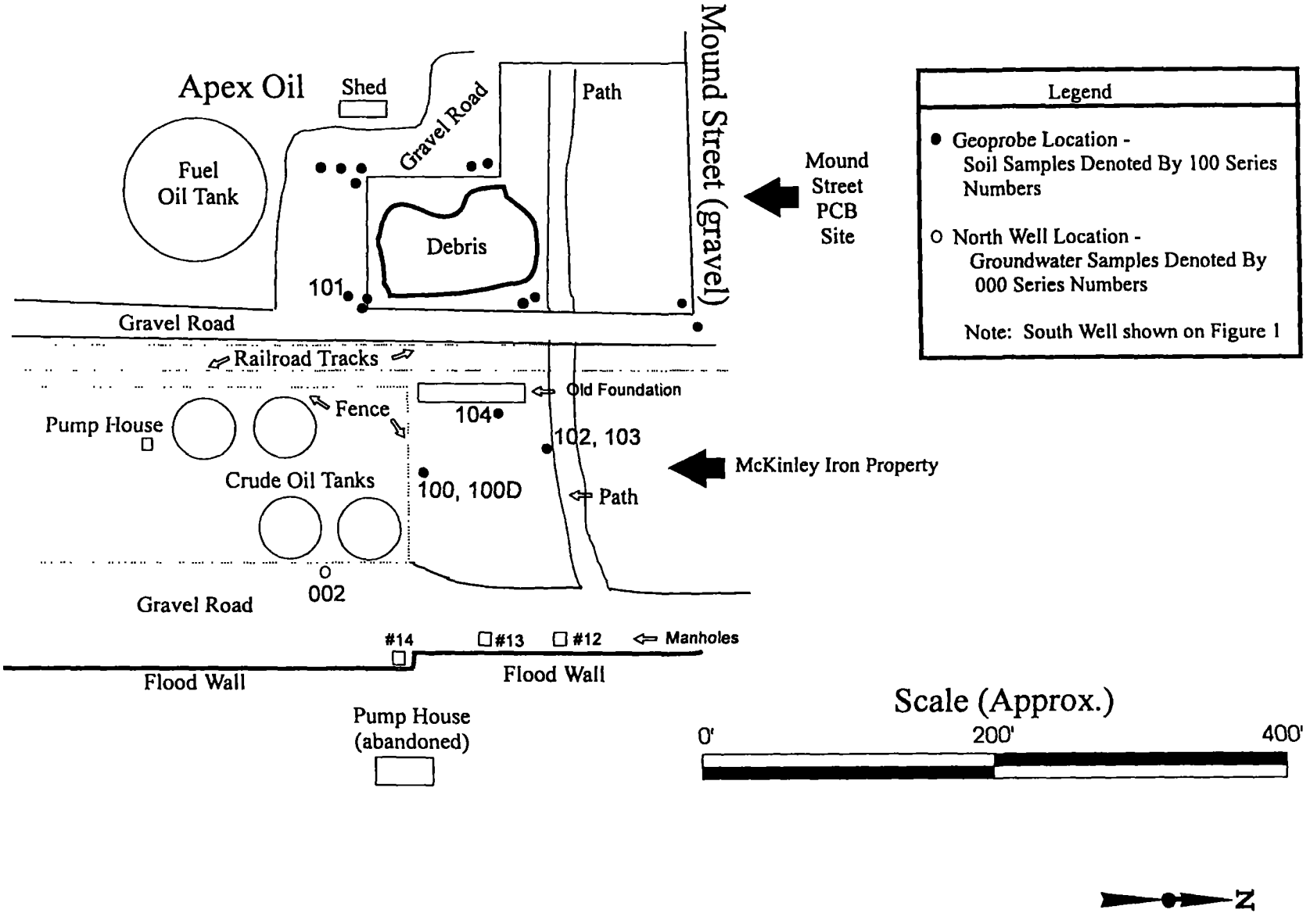
Sample No.	*Sample Description*	*Sample Location/Rationale*	*Analyses*	*Time/Date of Collection*
DC1CY-001	Existing South Well (Water)	Existing Monitoring Well - South Well/Identify contamination in aquifer	VOC Semi-vol PCB	11:28/4-3
DC1CY-001D	Existing South Well (Water)	Duplicate of DC1CY-001	VOC Semi-vol PCB	11:28/4-3
DC1CY-002	Existing North Well (Water)	Existing Monitoring Well - North Well/Identify contamination in aquifer	VOC Semi-vol PCB	12:15/4-3
DC1CY-003F	Field Blank (Water)	QA/QC	VOC Semi-vol PCB	9:15/4-3
DC1CY-007F	Trip Blank (Water)	QA/QC (Provided by Region VII Laboratory)	VOC	
DC1CY-008	Equipment Rinsate (Water)	QA/QC	VOC Semi-vol PCB	16:10/4-2
DC1CY-100	Off-site Geoprobe™ Boring (Soil)	Off-site/Identify contamination migration toward the Mississippi River from the former power plant building location.	VOC Semi-vol PCB	15:30/4-2
DC1CY-100D	Off-site Geoprobe™ Boring (Soil)	Duplicate of DC1CY-100	VOC Semi-vol PCB	15:30/4-2
DC1CY-101	On-site Geoprobe™ Boring (Soil)	Potential source area/Identify contamination at the former power plant building location.	VOC Semi-vol PCB	10:05/4-2

Table 2
Sample Summary
Mound Street PCB Site
St. Louis, Missouri
Sample Series DC1CY
April 2 - 3, 1996
(continued)

Sample No.	*Sample Description*	*Sample Location/Rationale*	*Analyses*	*Time/Date of Collection*
DC1CY-102	Off-site Geoprobe™ Boring (Soil)	Off-site/Identify contamination migration toward the Mississippi River from the former power plant building location.	VOC Semi-vol PCB	14:20/4-2
DC1CY-103	Off-site Geoprobe™ Boring (Soil)	Off-site/Identify contamination migration toward the Mississippi River from the former power plant building location.	VOC Semi-vol PCB	14:20/4-2
DC1CY-104	Off-site Geoprobe™ Boring (Soil)	Off-site/Identify contamination migration toward the Mississippi River from the former power plant building location.	VOC Semi-vol PCB	8:40/4-3
DC1CY-108F	Trip Black (Soil)	QA/QC (Provided by Region VII Laboratory)	VOC	



Sources: E&E/FIT 1991. SSI Laclede Coal Gas Site, St. Louis, Missouri. MDNR 1994. PA Mound Street PCB Site.	Project No.: 010865-370303	Mound Street PCB Site St. Louis, Missouri SVERDRUP	Groundwater Sample Location Map	Figure No.: 8a 4/96



Sources: E&E/FIT 1991. SSI Laclede Coal Gas Site, St. Louis, Missouri. MDNR 1994. PA Mound Street PCB Site.	Project No.: 010865-370303	Mound Street PCB Site St. Louis, Missouri	Geoprobe-Soil Sample Location Map	Figure No.: 8b
		SVERDRUP		4/96

Groundwater

A total of three groundwater samples were collected, prepared and delivered to the Region VII EPA Laboratory on April 4, 1996. All samples were analyzed for volatile organic compounds, semivolatile organic compounds and PCBs.

Prior to sample collection, the depth to water was measured using a Solinst electronic water level indicator. Depths were measured from the north side of the top of casing, which enabled the well volume to be calculated. The wells were purged until field parameters (pH, temperature, and specific conductance) had stabilized to within $\pm$ 10 percent. Field measurements were obtained using a YSI Incorporated Model 3560 Water Quality Monitoring System. A summary of field measurements obtained is included in Table 3.

Well purging was performed at a very low flow rate using a TAT Engineering peristaltic pump at the South Well and Geopump peristaltic pump at the North Well, with disposable tubing replaced prior to sampling. Extreme care was taken to prevent collecting an obviously turbid sample. Water samples were collected immediately after completion of purging activities, using the peristaltic pumps. Samples for volatile organic compounds were collected first, then the semivolatile and PCB samples were collected.

Previous groundwater sample data compiled by the E&E/FIT show the presence of VOCs and PAHs. Groundwater sample results obtained from the Sverdrup field activity are summarized in Table 4. Complete analytical data reports are included in Appendix C.

The results of this sampling indicate the presence of benzene and PAHs in the groundwater. Benzene was detected in the North Well at 38 μg/L. However, benzene was not detected above the 6 μg/L detection limit in the South Well. PAHs detected in the North Well sample were acenaphthene at 86 μg/L, fluorene at 29 μg/L, phenanthrene at 26 μg/L, and bis(ethylhexyl) phthalate at 32 μg/L. All analyzed compounds were nondetect in the South Well. PCBs were below detection limits in both the North and South Well.

Groundwater data appears consistent with historical data obtained from the site. Groundwater samples collected in 1991 by E&E/FIT showed 65 ug/L acenapthalene, 25 ug/L fluorene, 46 ug/L phenanthene, 93 ug/L benzene and 1600 ug/L cyanide in Well 204 (North Well). Well 203 (South Well) sample analysis did not show any contamination except for 590 ug/L cyanide. Both cyanide results were "J" coded, meaning the value is reported but is not valid under approved QC procedures.

Table 3
Field Measurement Summary
Mound Street PCB Site
St. Louis, Missouri
April 3, 1996

Well	*Well Depth (ft)*	*Depth to Water (ft)*	*Water Column (ft)*	*Estimated Purge Volume (gal)*	*Parameter Measurements*	*Comments*
South Well	46.06	26.07	19.99	1.4	pH =6.84, 6.98, 6.95, 6.98 Temp =19.2, 19.5, 19.8, 19.9 Cond =.948, .830, .936, .935	Peristaltic pump rate approximately 0.03 gpm. Well casing has a 1.5-inch port for sampling.
North Well	47.27	24.68	22.59	1.4	pH =6.75, 6.80, 6.78 Temp =18.6, 18.8, 19.7 Cond =.963, .958, .963	Peristaltic pump rate approximately 0.06 gpm. Well casing has a 1.5-inch port for sampling.

Temp = ° C.
Cond =mhos/cm
Minimum purge volume = 3 well volumes or measured parameters within 10%

Table 4
Groundwater Analysis Summary
Mound Street PCB Site
St. Louis, Missouri
April 3, 1996

Well	*Sample No.*	*benzene (ug/L)*	*acenaphthene (ug/L)*	*flourene (ug/L)*	*phenanthrene (ug/L)*	*bis(2-ethylhexyl) phthalate (ug/L)*
MCL	--------	5	----	----	----	----
South Well	DC1CY-001	<7	<1.1	<5	<1.1	<10
South Well Duplicate	DC1CY-001-D	<6	<1.1	<5	<1.1	<10
North Well	DC1CY-002	39	86	29	26	32

MCL = Maximum Contaminant Level
<## = Not detected at indicated detection level
Shading denotes well exceeds specific MCL or AL
* acetone (common laboratory contaminant) was detected in sample 001 (South Well) at 7 μg/L, and in 002 (North Well) at 8 μg/L.

Subsurface Soil

A total of six subsurface soil samples, including one duplicate, were collected, prepared and delivered to the Region VII EPA Laboratory on April 4, 1996. All samples were analyzed for volatile organic compounds, semivolatiles and PCBs. No background sample was collected for this field activity. Background concentrations identified during the 1991 Laclede Coal Gas SSI conducted by E&E/FIT will be used. The soil samples collected in this SSI were then compared to the background levels to determine if significant contamination above background levels existed at the site.

Soil samples were collected April 2 - 3, 1996. Samples were collected from four discrete locations using a Geoprobe™. The soil samples were collected from the following depths:

DC1CY-100	25 - 27 feet
DC1CY-101	17 - 19 feet
DC1CY-102	18 - 20 feet
DC1CY-103	25 - 27 feet
DC1CY-104	25 - 27 feet

Soil samples were collected by removing the sample from the sample tube and placing it in a disposable aluminum pan. Geoprobe™ boring rods and sample tube were decontaminated between samples.

Previous subsurface and surface soil sample data compiled by E&E/FIT show the presence of VOCs, PAHs and metals in the soils. Soil sample results obtained from the Sverdrup field activity are summarized in Table 5. Complete analytical data reports are included in Appendix C.

The soil sampling results for Sample DC1CY-102 indicate the presence of PAHs in the subsurface. Naphthalene was detected in Sample DC1CY-102 at 150 ug/kg, fluoranthene at 570 ug/kg, pyrene at 520 ug/kg, and carbon disulfide at 22 ug/kg. These results are less than the background levels identified below. Sample analysis showed levels of volatiles, semivolatiles and PCBs below the detection limits for the other sample locations (100, 100D, 103, and 104).

The compounds of concern were identified by comparing the average of the impacted area samples to the average background sample. Where the ratio of impacted sample to background sample exceeded 3, this material was assumed to have originated from site activities (U.S. EPA, 1992). Background for PCBs is assumed to be nondetect. Background levels for volatile organics and semivolatile organics were taken from the 1991 Laclede Coal Gas SSI conducted by E&E/FIT and are as follows:

Contaminant	Concentration	Contaminant	Concentration
Pyrene	1.40 mg/kg	Benzene	<0.25 mg/kg
Benzo(k)fluoranthene	0.68 mg/kg	Toluene	<0.25 mg/kg
Benzo(a)pyrene	0.70 mg/kg	Xylene	<0.25 mg/kg
Benzo(b)fluoranthene	0.61 mg/kg	Ethylbenzene	<0.25 mg/kg
Benzo(a)anthracene	0.79 mg/kg		
Chrysene	0.85 mg/kg		
Phenanthrene	0.44 mg/kg		
Fluoranthene	1.30 mg/kg		
Other PAHs	<0.41 mg/kg		
Total PAHs	6.80 mg/kg		

Health based screening concentrations for soils correspond to a 10^{-6} individual cancer risk or a noncancer exposure level corresponding to a reference dose (RfD) under specific exposure assumptions. Based on the Laclede Coal Gas SSI sampling results, the cancer risk screen concentrations for benzo(a)pyrene (0.088 mg/kg), benzo(b)fluoranthene (0.88 mg/kg), benzo(a)anthracene (0.88 mg/kg), and ideno(1,2,3-cd)pyrene (0.88 mg/kg) have been exceeded in soil sample DSX44-109 (Reference 3 and 31). A cancer risk screen concentration for pyrene, cyanide, fluoranthene, acenaphthene, anthracene, and fluoranthene has not been assigned. The RfD for pyrene (2,300 mg/kg) was not exceeded is soil sample DSX44-102; for cyanide (1,600 mg/kg), fluorene (3,100 mg/kg), and acenaphthene (4,700 mg/kg) was not exceeded in soil sample DSX44-108; and for anthracene (23,000 mg/kg) and fluoranthene (3,100 mg/kg) in soil sample DSX44-109 (Reference 3 and 31). Thr RfD for benzene (22 mg/kg), toluene (16,000 mg/kg), and xylene (160,000 mg/kg) was not exceeded in any soil sampled (Reference 3 and 31). A cancer risk screen concentration and benchmark RfD for naphthalene, 2-methylnaphthalene, acenaphthylene, and phenanthrene have not been determined (Reference 31).

Surface Water

No surface water and sediment samples were proposed or collected during the April 1996 SSI activity.

Air Quality

No air quality samples were proposed or collected during the April 1996 SSI activity.

Table 5
Soil Analysis Summary
Mound Street PCB Site
St. Louis, Missouri
April 2 - 3, 1996

Sample No.	*naphthalene (ug/kg)*	*fluoranthene (ug/kg)*	*pyrene (ug/kg)*	*carbon disulfide (ug/kg)*
DC1CY-100	<130	<100	<300	<8
DC1CY-100-D	<130	<100	<310	<10
DC1CY-101	<120	<98	<300	<6
DC1CY-102	150	570	520	22
DC1CY-103	<130	<110	<320	<6
DC1CY-104	<130	<100	<310	<6

<## = Not detected at indicated detection level

* acetone (common laboratory contaminant) was detected in sample 100 at 28 μg/L, 101 at 18 μg/L, 103 at 18 μg/L, and 104 at 17 μg/L.

** methylene chloride (common laboratory contaminant) was detected in sample 100 at 17 μg/L

3.5 MODIFICATIONS TO APPROVED FIELD SAMPLING PLAN

All SSI field activities were conducted in accordance with the Field Sampling Plan (FSP), approved by Region VII EPA on March 26, 1996 (Reference 23), and the Site Health and Safety Plan, approved by Sverdrup on February 8, 1996. Modifications to the FSP were as follows:

1) Soil and water sample numbers do not correspond to the numbers submitted in the FSP. The activity number is the same as submitted in the FSP.

2) Numerous attempts were made to collect subsurface soil samples from the area around the former building location. The Geoprobe™ could not penetrate through a solid layer, believed to be concrete, at a depth of approximately 18 - 20 feet. Attempts were made to collect soil samples above this solid layer; however, none were able to be obtained except for the southeastern corner sample (Figure 8b; Appendix A, Photo 9). In the southwestern corner of the former building location, the Geoprobe™ could not go beyond 4 feet and in a two instances, 1 foot. Attempts near the northeastern corner of the former building location were made with refusal occuring at 15 feet. A sample was attempted; however, only a small amount of brick and gravel was retrieved in the sample tube. Along the eastern edge of the former building location, refusal occurred at 18.5 feet. A sample was attempted; however, only a small amount of concrete and brick was retrieved. Water was observed in the soil sample tube; however, there was not enough water to sample. Attempts to collect soil and water samples were halted in this area due to bricks, rock and concrete debris encountered at the former building site (Figure 8b).

3) Subsurface soil samples were collected in a vacant area between the former building location and the concrete flood wall (Figure 8b; Appendix A, Photo 10). Five subsurface soil samples were collected in three sample locations. Two samples were collected from the same probe boring at 18 - 20 feet and at 25 - 27 feet below ground surface. One sample and duplicate were obtained from two adjacent borings in one area (Appendix A, Photo 11). The fifth sample was obtained approximately half way between the other two locations (Figure 8b).

4) Well purging was performed using a peristaltic pump instead of the Geoprobe™ vacuum system or disposable bailers. The peristaltic pump is more effective than the Geoprobe™ vacuum system and bailers could not be used, due to the small (1.5 inch) sampling port diameter on the monitoring wells.

5) Three well volumes were not extracted from the wells during purging activities. The water level was at 26.07 feet below ground surface at the South Well, and was at 24.68 feet below ground surface at the North Well. The bottom of the wells are 46.06 feet and 47.27 feet below ground surface for the South Well and North Well, respectively. Tubing was installed in the wells to pump from approximately 30 feet below ground surface. Pumping was conducted near the maximum head that the peristaltic pump could overcome. At the pumping rates attained by the peristaltic pumps, it would have required approximately 16 hours to remove one well volume. It was decided to collect water samples after the pH, temperature and conductivity parameters were within 10 percent for two consecutive readings, regardless of the volume removed.

3.6 QUALITY ASSURANCE AND QUALITY CONTROL

Quality Assurance/Quality Control (QA/QC) samples collected during the SSI include one groundwater duplicate (DC1CY-001D), one soil duplicate (DC1CY-100D), one water trip blank (DC1CY-007F), one soil trip blank (DC1CY-108F), one water field blank (DC1CY-003F), and one soil sample equipment rinsate (DC1CY-008) collected from the decontaminated sample tube.

Duplicate Analysis

Duplicate samples were used to measure sample homogeneity and precision. Field sampling precision is measured by the Relative Percent Difference (RPD) between the analytical results of the sample and its respective duplicate. The RPD is calculated by using the following equation:

$$RPD = \frac{(|X_1 - X_2|)}{(X_1 + X_2)/2} \times 100$$

Acceptance criteria specified for this investigation were defined in the FSP, and varied for water and soil matrices. One duplicate analysis was performed for each matrix, and included samples DC1CY-001-D for water and DC1CY-100-D for soil.

RPD data objectives outlined in the field sampling plan detailed a 20 percent RPD goal for water analyses, and a 35 percent RPD goal for soil analyses. All analyzed compounds from DC1CY-001 and DC1CY-001D water samples were below detection limits except for acetone. Acetone is a common laboratory contaminant, and was detected at 7 ug/L in Sample 001. Acetone was not detected in Sample 001D at a detection limit of 4 ug/L. Therefore, the RPD could not be calculated. The failure to meet RPD objective for water was not deemed significant. All analyzed compounds from DC1CY-100 and DC1CY-100D were below the detection limits except for acetone and methylene chloride. Both acetone and methylene chloride are common laboratory contaminants, and were detected at 28 ug/kg and 17 ug/kg, respectively, in sample 100. Acetone and methylene chloride were not detected in Sample 100D at a detection limit of 21 ug/kg and 70 ug/kg, respectively. Therefore, the RPD could not be calculated. The failure to meet RPD objective for soil was not deemed significant. The data and regulatory interpretation for both water and soil was not changed due to inability to calculate RPD values.

Field and Trip Blank Analysis

Two water blanks were included in this activity, a field blank (DC1CY-003F) and a trip blank (DC1CY-007F) and one soil blank, a trip blank (DC1CY108F). Field blanks were used as an indicator of sample contamination during the sample collection and handling activities, including sampling, transport, sample preparation, and analysis. Trip blanks were used to measure potential cross contamination during the shipping, storing, and transferring of samples.

The trip blank was prepared by the EPA Region VII Laboratory and carried in the iced sample cooler throughout the sampling event. The results of the water trip blank indicate the presence of acetone at 13 μg/L. The results of the soil trip blank indicate the presence of acetone at 580 μg/kg. Acetone is a common laboratory analysis contaminant. The soil trip blank results also indicate the presence of methyl ethyl ketone at 28 μg/kg, 4-methyl-2-pentanone at 10 μg/kg, 1,2-dichlorobenzene at 11 μg/kg, 1,3-dichlorobenzene at 27 μg/kg, and 1,4-dichlorobenzene at 26 μg/kg. The source of these compounds is

unknown; however, they were not detected in any other sample. It appears as though no contaminants were introduced to the sample containers during sample control.

The field blank was prepared in the field, using deionized water. The water was slowly poured into the appropriate sample containers for volatile organic, semivolatile and PCB analysis. The sample results indicate the presence of acetone at 20 μg/L. Acetone is a common laboratory analysis contaminant.

Performance Audit Sample Analysis

No performance audit sample was collected.

Equipment Rinsate Analysis

The rinsate sample was used to verify the effectiveness of the decontamination procedure. The rinsate blank was collected on April 2, 1996, at approximately 1610. The rinsate blank (DC1CY-008) was collected by pouring deionized water into the decontaminated sample tube used for collecting the soil from sample point DC1CY-100. Sample DC1CY-008 was analyzed for volatile organics, semivolatiles and PCBs. The results of this sample indicate the presence of acetone at 15 μg/L. Acetone is a common laboratory analysis contaminant. The results of the testing indicate that effective decontamination procedures were being performed, with minimal cross-contamination of samples occurring due to incomplete decontamination processes.

4.0 GROUNDWATER PATHWAY

4.1 GEOLOGIC/HYDROGEOLOGIC SETTING

The Mound Street PCB Site is located on a "narrow strip of alluvium" between the Mississippi River and limestone bedrock located in the area. Fill material, estimated at 15 to 18 feet thick, overlays the alluvium at the site (Reference 10). Stratified river aluvium consists of silt, clay, and silty clay which becomes coarser with depth and includes gravel lenses. The alluvium can be up to 80 feet thick, with clay and silty clay at shallow depths and silty sand and sand in the deeper portions (Reference 20). Prior to construction of the concrete flood wall, several borings were conducted in the vicinity of the site (Figure 9a; Reference 25). The logs for four borings (Figure 9b) show cinders, concrete, rock, and bricks to depths of approximately ten feet below ground surface nearest the site (Borings 842 and 862) and to depths of 15 to 26 feet toward the Mississippi River (Borings 823 and 824). Silt, clay or a mixture of silt and clay are shown underlying the cinders to the limestone bedrock, which was encountered at 24 feet below the ground surface in Boring 842 and at 38 feet in Boring 862. Bedrock was not encountered in Borings 823 and 824 (Reference 25). No confining layer is known to exist between the alluvium and bedrock. Also, no aquifer discontinuity exists within the 4-mile target distance limit (Reference 20). Based on Geoprobe borings conducted during the April, 1996, field activities, the location of the former Mound Street Building is underlain by rock, concrete, bricks and other debris. On the vacant property east of the site, native silt material was encountered to a depth of 27 feet (Reference 24).

The bedrock consists of upper Mississippian limestone formations which are, in descending order, the Ste. Genevieve Limestone, St. Louis Limestone, shaley limestones of the Salem Formation and Warsaw Formation, Burlington-Keokuk Limestone, and Fern Glen Formation (References 3 and 20). These formations are approximately 600 feet thick (Reference 3).The depth to bedrock is estimated to be from 20 to 30 feet (Reference 3). The shallowest aquitard in the area is the Maquoketa Shale at the top of the Ordovician System (Reference 20).

The depth to groundwater is generally approximately two feet above the Mississippi River and is estimated at 20 feet (Reference 3). Groundwater movement is toward the river, to the east and southeast of the site (References 20 and 21). The groundwater depth was measured at 25 feet below the ground surface during the field activities for this SSI.

Sinkholes and caves are found in the Mississippian bedrock within the target area. The karst aquifer probably does not directly underlie the site and probably does not affect contaminant transport from the site (Reference 21).

4.2 GROUNDWATER SAMPLE RESULTS

Groundwater sample results obtained from this activity are summarized in Table 4 (Section 3.0). Complete analytical data reports are included in Appendix C.

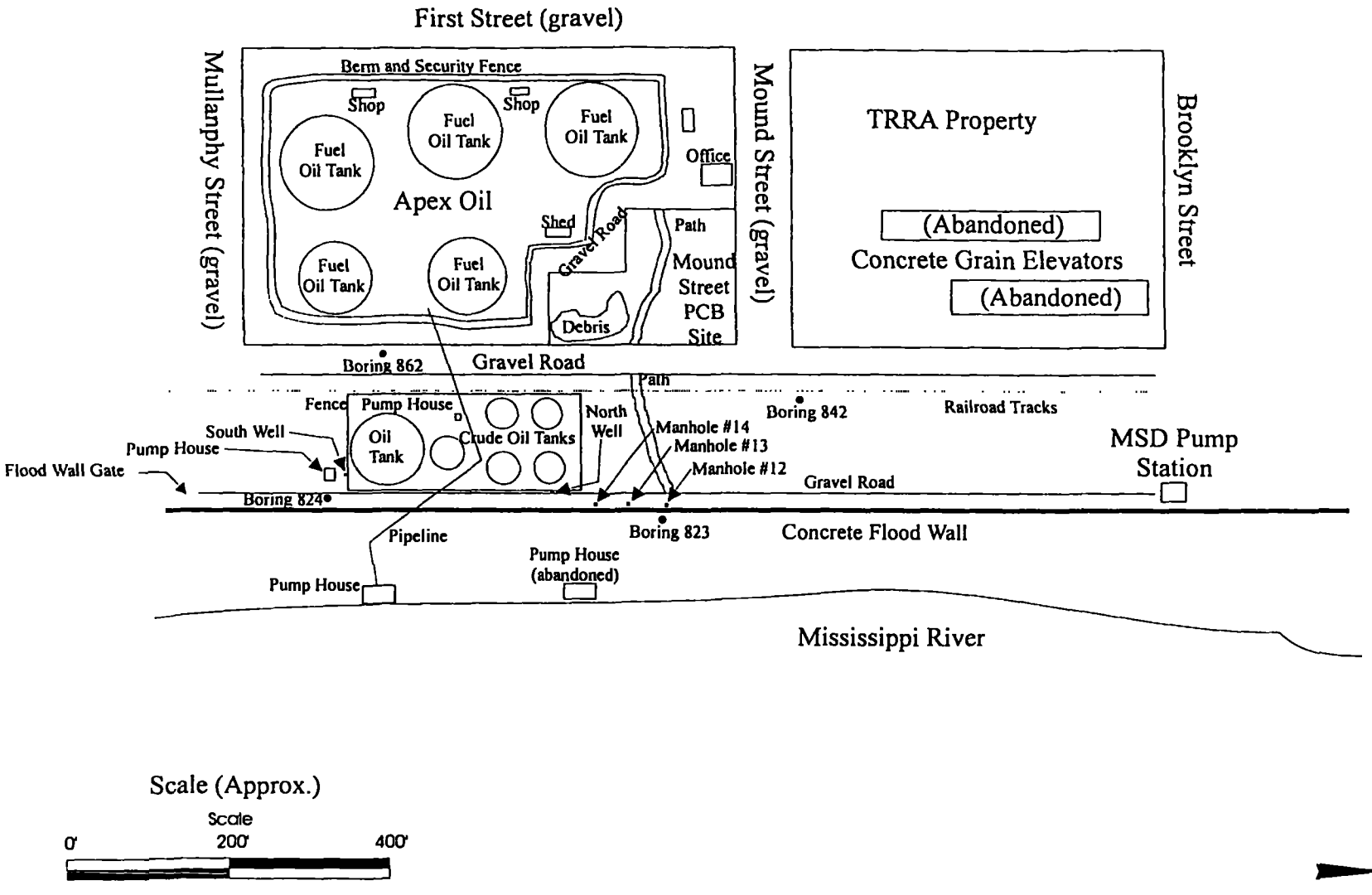
The results of this sampling indicate the presence of benzene and PAHs in the groundwater. Benzene was detected in the North Well at 38 μg/L. However, benzene was not detected above the 6 μg/L detection limit in the South Well. PAHs detected in the North Well sample were acenaphthene at 86 μg/L, fluorene at 29 μg/L, phenanthrene at 26 μg/L, and bis(ethylhexyl) phthalate at 32 μg/L. All analyzed compounds were nondetect in the South Well. PCBs were nondetect in both the North and South Well.

Groundwater data appears consistent with historical data obtained from the site. Groundwater samples collected in 1991 showed 65 ug/L acenapthalene, 25 ug/L fluorene, 46 ug/L phenanthene, 93 ug/L benzene and 1600 ug/L cyanide in Well 204 (North Well). Well 203 (South Well) sample analysis did not show any contamination except for 590 ug/L cyanide. Both cyanide results were "J" coded, reflecting that values are reported but are not valid under approved QC procedures. Groundwater samples were collected in 1991 during an investigation of the Laclede Coal Gas Site. Volatiles, PAHs and cyanide were detected in the groundwater samples collected. Samples were not analyzed for PCBs. Refer to Table 1 and Figures 6a and 6b for sample data and locations.

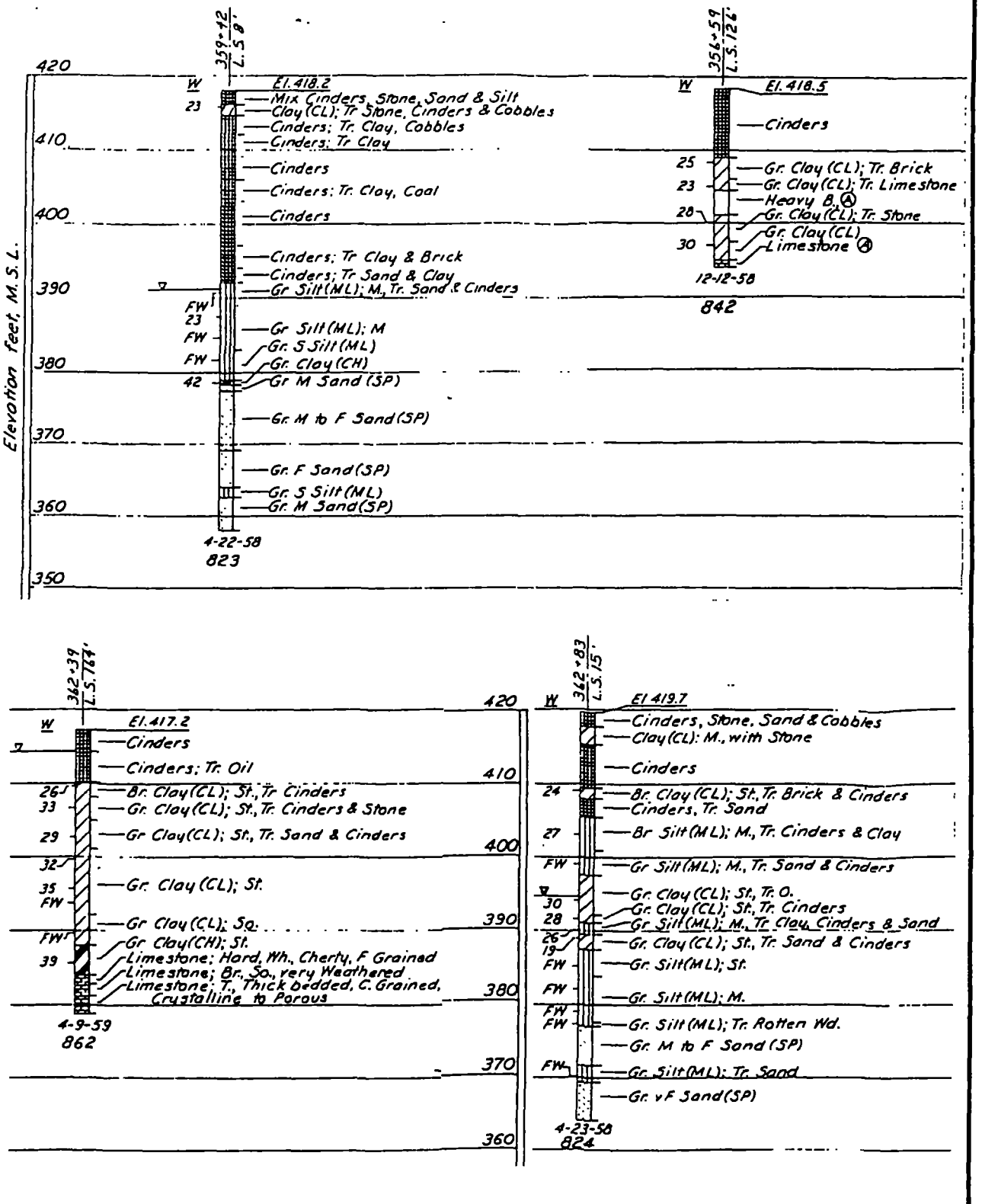
4.3 GROUNDWATER USAGE AND TARGETS

Groundwater within a 4-mile radius of the site is not used for drinking water (References 4, 17 and 20). Irrigation of agricultural crops is possibly conducted via groundwater. The site is not located within a wellhead protection area (Reference 20).

The Mississippi River is located approximately 100 feet east of the sampled monitoring wells and the groundwater level fluctuates with the river level (Reference 3, 20 and 21). Therefore, the groundwater-to-surface water migration route is a potential exposure pathway.



Source: U.S. Army Corps of Engineers St. Louis District, 1962	Project No.: 010865- 370303	Mound Street PCB Site St. Louis, Missouri SVERDRUP	U.S. Army Corps of Engineer Flood Wall Boring Location Map	Figure No.: 9a 5/96



Source: U.S. Army Corps of Engineers-St. Louis District, 1962.

Project No.: 010865-370303	Mound Street PCB Site St. Louis, Missouri	Corps of Engineers Flood Wall Boring Data	Figure No.: 9b
	SVERDRUP		5/96

5.0 SURFACE WATER PATHWAY

5.1 SURFACE WATER PATHWAY

The Mound Street PCB Site is located approximately 300 feet west of the Mississippi River and is protected from flooding by a concrete flood wall located approximately 200 feet east of the site. Average streamflow on the Mississippi River is greater than 100,000 cubic feet per second (Reference 15). The 15-mile downstream distance limit is shown in Figure 10. The concrete flood wall was built to withstand the 500-year flood, therefore, the site is outside the 500-year flood plain of the Mississippi River. Surface water runoff from the site is collected in the storm sewer system, which is connected to the sanitary sewer system. The sanitary sewer system flows to the Bissle Point Treatment Plant, approximately 2.5 miles upstream of the site (Reference 15). No channels or ditches were observed crossing the site property.

During the site reconnaissance conducted by E&E/FIT on November 20, 1990, seepage was observed from the foundation and pipe system of an abandoned pump house, formerly part of the Mound Street Power Plant. Since the pump house was on the river side of the flood wall, direct observation of a release to the surface water pathway was made. However, the source of the seepage was not known or determined, no sample was collected, and no description of the material seeping into the river was made. It is assumed to be an oil substance or mixture; however, there is no evidence of the oil being contaminated with PCBs.

5.2 SURFACE WATER SAMPLE RESULTS

No surface water or sediment samples were collected during this site investigation. Surface water and sediment samples have been collected near the Mound Street PCB Site. Sample analysis results are shown in Table 1. These samples were not analyzed for PCBs. A raw water sample was collected from the East St. Louis water intake of the Illinois-American Water Company, by E&E/FIT, during field activities conducted March 3-9, 1991. No contaminants were detected except for 12-14 ug/L chromium, 15-18 ug/L lead and 46-54 ug/L zinc. However, the sample was not tested for PCBs. Subsurface soil samples and groundwater samples were collected for the surface water pathway (groundwater to surface water migration route). The results obtained from this activity are summarized in Tables 4 and 5 (Section 3.0). Complete analytical data reports are included in Appendix C.

Subsurface Soil

The soil sampling results for Sample DC1CY-102 indicate the presence of PAHs in the subsurface. Naphthalene was detected in Sample DC1CY-102 at 150 ug/kg, fluoranthene at 570 ug/kg, pyrene at 520 ug/kg, and carbon disulfide at 22 ug/kg. These results are less than the background levels identified during the 1991 SSI of the Laclede Coal Gas Site. Sample analysis showed levels of volatiles, semivolatiles and PCBs below the detection limits for the other sample locations (100, 100D, 103, and 104).

Subsurface soil samples were collected in 1991 during an investigation of the Laclede Coal Gas Site. Volatiles, PAHs and cyanide were detected. Samples were not analyzed for PCBs. Refer to Table 1 and Figures 6a and 6b for sample data and locations.

Groundwater

The results of this sampling indicate the presence of benzene and PAHs in the groundwater. Benzene was detected in the North Well at 38 μg/L. However, benzene was not detected above the 6 μg/L detection limit in the South Well. PAHs detected in the North Well sample were acenaphthene at 86 μg/L, fluorene at 29 μg/L, phenanthrene at 26 μg/L, and bis(ethylhexyl) phthalate at 32 μg/L. All analyzed compounds were nondetect in the South Well. PCBs were nondetect in both the North and South Well.

Groundwater samples were collected in 1991 during an investigation of the Laclede Coal Gas Site. Volatiles, PAHs and cyanide were detected in the groundwater samples collected. Samples were not analyzed for PCBs. Refer to Table 1 and Figures 6a and 6b for sample data and locations.

Surface Water

Samples collected during the 1991 investigation of the Laclede Coal Gas Site showed low concentrations of metals in the Mississippi River. Volatiles were not detected in the sediments; however PAHs, cyanide and metals were detected in the sediments. Samples were not analyzed for PCBs. Refer to Table 1 and Figures 6a and 6b for sample data and locations.

5.3 SURFACE WATER USAGE AND TARGETS

The Illinois American Water Company has a surface water intake at East St. Louis, located on the east side of the Mississippi River (Appendix A, Photo 12), less than one-tenth of a mile downstream from the subject site (References 3 and 20). The Illinois-American Water Company serves 19 communities with a combined service population of approximately 300,000 persons (References 15 and 17). The East St. Louis intake water is blended with an intake on Chouteau Island, approximately 10 miles upstream of the site. The East St. Louis intake provides approximately 60 percent of the required production (Reference 17). The likelihood of contaminants originating from the site entering the Illinois-American surface water intake is low for the following reasons:

> The surface water intake is located across the Mississippi River from the site and slightly downstream. The intake is almost directly across the river from the site.
>
> The Mississippi River has a flow of at least 100,000 cubic feet per second providing a dilution of 0.00001, per the Site Inspection Worksheets.
>
> Contaminants would enter the river along the western edge of the river and progress outward in a plume. Such a plume would unlikely reach the eastern bank in such a short distance, rather contaminants would move directly south via the channel of the river.

No other surface water intakes are located within the 15-mile downstream target limit, except for industrial water usage intakes (Reference 15).

The Mississippi River (Appendix A, Photo 13) is a primary target with the following use designations; irrigation, livestock and wildlife watering, protection of warm water aquatic life and human health-fish consumption, boating and canoeing, drinking water supply, and industrial uses (Reference 16). It is also

a primary fishery, with commercial and sport fishing occurring along the river. The commercial fish harvest by licensed fishermen in 1992 was reportedly 7,768 pounds for St. Louis County (Reference 18).

National Wetland Inventory Maps of the site area and 15 miles downstream along the Mississippi River were reviewed by MDNR during the completion of the PA. Approximately 0.7 miles of palustrine wetlands occur on the Illinois side of the river. No wetlands are reported on the Missouri side of the river (Reference 15).

State and federally listed and proposed threatened and endangered species which may occur in the vicinity of the site include the Pallid Sturgeon and Sicklefin Chub, big river fish that may have a wide range of occurance in the Mississippi River (Reference 2).

The Jefferson National Expansion Memorial, a 90-acre park with 2.7 million visitor per year (Reference 1), is located approximately 1 mile downstream of the site.

The Jefferson Barracks Park and National Cemetary are located approximately 15 miles downstream from the site (Reference 14).

Source: Missouri Highway Map, 1993

Mound Street PCB Site St. Louis, Missouri	Surface Water Pathway Map	Figure No.: 10
		Project No.: 010865-370303
SVERDRUP		5/96

6.0 SOIL EXPOSURE

6.1 PHYSICAL CONDITIONS

The Mound Street PCB Site is located in an industrial area near the Mississippi River. Fill material has been placed on the site to elevate it above the normal flood level (Reference 3). Fill near the site is approximately 12 deep and consists of demolition debris, including cinders, brick and cobble size stones (Reference 10). The former building basement was reportedly 12 - 14 feet below the ground surface and may have been filled with the building demolition debris (Reference 22). Beneath the fill is stratified native river alluvium. The area around the site is characterized as urban land, bottom land on 0 to 3 percent slopes. It is reported that these areas were originally bottom land or terrace land, and have been built-up with fill material (Reference 26). On the vacant property east of the site, native silt material was encountered to a depth of 27 feet (Reference 24).

Access to the site is unlimited, there are no fences or other barriers associated with this site. The site buildings were demolished in March of 1991 after an oil fire in the basement (Reference 3). The property is currently vacant with no structures present. Tall weeds were observed growing on the site during the December, 1995, site reconnaissance (Reference 22). No obvious erosional problems were observed during field activities (References 22 and 24).

6.2 SOIL SAMPLE RESULTS

Surface soil samples were collected in 1991 during an investigation of the Laclede Coal Gas Site. Volatiles, PAHs and cyanide were detected. Samples were not analyzed for PCBs. Refer to Table 1 and Figures 6a and 6b for sample data and locations.

6.3 SOIL EXPOSURE PATHWAY TARGETS

There are no residences on the site and the nearest residence is over one-quarter mile from the site (Reference 3). The nearest school is over one-half mile from the site (Reference 15). The surrounding area is commercial/industrial, with PFT-Apex Oil and TRRA being the closest facilities. Workers from each facility are in the vicinity of the site daily. However, they would not normally be physically on the Mound Street PCB Site, since it is a vacant lot and outside of their normal work areas (Reference 15).

Population within a 1-mile radius of the site is estimated at 3,755 persons on the Missouri side only (References 15). The population within a 4-mile radius of the site is approximately 207,100 persons (References 3). The following is an estimate of population in radial distance from the site, assuming the same density of people in each distance range:

Radial Distance	Percentage of Area		Population Range
0 - 0.25 mi	0.40		828
0.25 - 0.5 mi	1.17		2,423
0.5 - 1.0 mi	4.67		9,672
1.0 - 2.0 mi	18.76		38,852
2.0 - 3.0 mi	31.23		64,677
3.0 - 4.0 mi	43.76		90,627
		Total	207,100

The Jefferson National Expansion Memorial - Gateway Arch is approximately one mile downstream of the site. The National Park Service operates the park which encompasses 90 acres and has approximately 2.7 million visitors per year (Reference 1). No other sensitive environments occur within a 4-mile radius of the site (Reference 15).

7.0 AIR PATHWAY

Threats to the air pathway are evaluated as low because there have been no observed releases via the air pathway and there are few potential receptors. Air sampling was not conducted as part of this SSI. No air samples have been previously collected for this site.

8.0 SCREENING SITE INSPECTION SUMMARY

The Mound Street PCB Site is located in the City of St. Louis at the eastern end of Mound Street (near the intersection of Mound Street and First Street). The geographic coordinates of the site are 38° 38' 34.0" north latitude and 90° 10' 57.2" west longitude.

The Mound Street PCB Site is part of the Laclede Gas and Light Company former manufactured gas plant (FMGP) site, which operated in the late 1800s to the mid-1940s. On-site burial of coal tar wastes was typically conducted in unlined pits. In 1940, operations were split between Laclede Gas Light Company (Laclede Gas) and Laclede Power and Light Company (Laclede Electric). In 1945, Union Electric (UE) purchased the entire coal-gas facility and operated the Mound Street Power Plant from 1945 to 1973. UE did not manufacture coal-gas at this site. In 1969, the Apex Oil Company purchased the former coal gas works (Laclede Gas) from UE. UE, however, continued to operate its electrical facility from the former Laclede Electric works. In 1973, the UE property (Laclede Electric works) was transferred to the Tenlis Company. Tenlis dismantled the power generation and transmission equipment. Transformer oil was reportedly disposed by Midwest Oil Company. The dismantled equipment was sold as scrap metal. In 1981, Tenlis transferred the property to AZCON. The operations of AZCON are unknown; however, it was reported in the MDNR PA report that AZCON could have been a metal recycling company. In 1985, Mound Street Corporation became the property owner and leased the building to an individual for an electric motor stripping operation. An oil fire occurred in the basement of the building in 1989, and the building was demolished in the spring of 1991. McKinley Iron became the owner of the property in 1993.

The total area of the Mound Street PCB Site is estimated at approximately 1.5 acres. The property does not have any buildings or other structures, and is currently vacant.

Several investigations were conducted at this site over the last 20 years. Oil samples were collected on two different occasions from the former building basement. All PCB results have been below detection limits. Seepage was observed emanating from the foundation and piping system of an abandoned pump house, formerly part of the Mound Street Power Plant. The pipes were reportedly plugged with concrete; however, seepage was leaching through the concrete. The pump house is located on the eastern side of the flood wall, therefore, the seepage was going directly into the Mississippi River. No samples were collected and no description of the seepage material was made during the site reconnaissance. Soil, groundwater, surface water and sediment sampling conducted near the site identified the presence of volatile organics, PAHs and cyanide. The PAH and cyanide contamination was attributed to the former coal-gas operations. It was also stated that benzene, xylene, and some PAH contamination may be attributed to the adjacent PFT-Apex Facility.

Oil containing PCBs was discovered in July, 1993, at the Brooklyn Street storm-water pump station, located approximately 400 feet north of the Mound Street PCB Site. The possible source was identified as an underground storage tank (UST) on the adjacent property. The UST, removed in 1993, was located on Terminal Railroad Association (TRRA) property, southwest of the Brooklyn Street pump station. The TRRA property is located on the north side of Mound Street, directly across from the Mound Street PCB Site. In the conclusion of the Special Problem Investigation report completed by MSD, it is stated the UST appears to be the source of the oil in the pump station. It is further stated that ground saturation of oil from an old Union Electric facility is another possibility. No further incidences of oil in the Brooklyn Street pump station or manholes along the flood wall have occurred since the 1993 spill.

The Mound Street PCB Site is underlain by fill, Mississippi River alluvium, and limestone bedrock. Fill most likely consists of rock, brick, concrete, cinders, and other debris. Silt, clay or a mixture of silt and clay comprise the Mississippi River alluvium. No confining layer is known to exist between the alluvium and bedrock and no aquifer discontinuity exists within the 4-mile target distance limit. The depth to groundwater is approximately two feet above the Mississippi River and is estimated at 20 feet. Groundwater movement is toward the river, to the east and southeast of the site. The groundwater depth was measured at 25 feet below the ground surface during the field activities for this SSI. Groundwater samples from existing monitoring wells indicate the presence of benzene, cyanide and PAHs in the groundwater. The groundwater-to-surface water migration route is the pathway of most concern.

The Mound Street PCB Site is located approximately 300 feet west of the Mississippi River and is protected from flooding by a concrete flood wall located approximately 200 feet east of the site. Surface water runoff from the site is collected in the storm-sewer system, which is connected to the sanitary-sewer system. No channels or ditches were observed crossing the site property. Seepage was observed in 1990 leaking from the foundation and pipe system of an abandoned pump house, formerly part of the Mound Street Power Plant. Since the pump house is on the river side of the flood wall, direct observation of a release to the surface water pathway was made. Sampling of surface water and sediment indicate the presence of metals in the surface water, and the presence of xylene and PAHs in the sediment.

The Mound Street PCB Site is located in an industrial area near the Mississippi River. Access to the site is unlimited, there are no fences or other barriers associated with this site. The site buildings were demolished in March of 1991 after an oil fire in the basement. The property is currently vacant with no structures present. Tall weeds and other vegetation were observed growing on the site during the December, 1995, site reconnaissance. No obvious erosional problems were observed during field activities. Soil sampling indicate the presence of benzene, toluene, xylene and PAHs in the subsurface soil, and the presence of cyanide and PAHs in the surface soil. Health based screening concentrations for soils correspond to a 10^{-6} individual cancer risk or a noncancer exposure level corresponding to a reference dose (RfD) under specific exposure assumptions. Based on the Laclede Coal Gas SSI sampling results, the cancer risk screen concentrations for benzo(a)pyrene (0.088 mg/kg), benzo(b)fluoranthene (0.88 mg/kg), benzo(a)anthracene (0.88 mg/kg), and ideno(1,2,3-cd)pyrene (0.88 mg/kg) have been exceeded. The RfDs for pyrene (2,300 mg/kg), cyanide (1,600 mg/kg), fluorene (3,100 mg/kg), acenaphthene (4,700 mg/kg), anthracene (23,000 mg/kg), and fluoranthene (3,100 mg/kg) have been exceeded.

Threats via the air exposure pathway are considered low due to the vegetative cover and low volatility of the chemicals of concern. No air samples have been collected.

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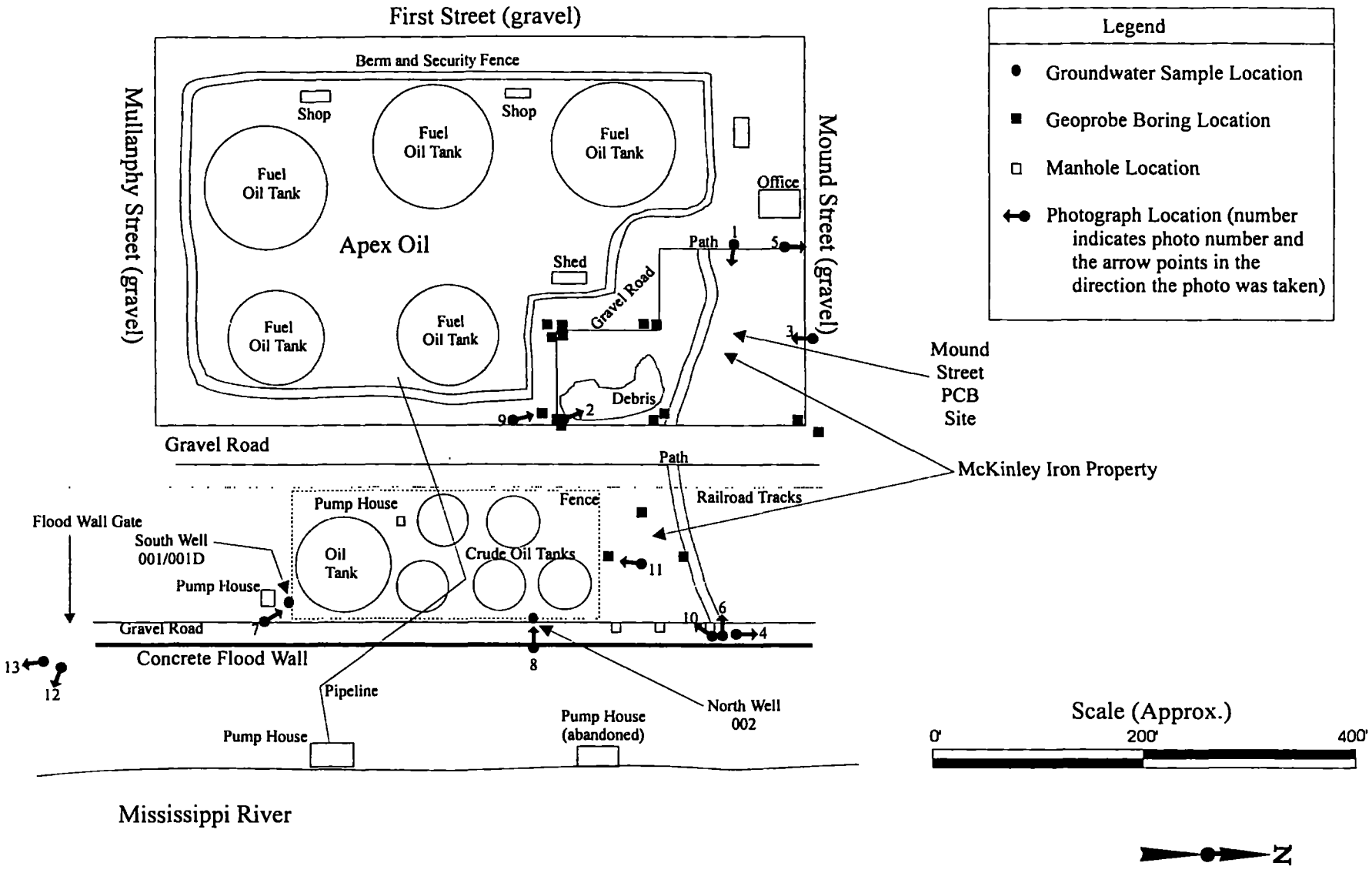
APPENDIX A

PHOTOGRAPH RECORD



Sources: E&E/FIT 1991. SSI Laclede Coal Gas Site, St. Louis, Missouri. MDNR 1994. PA Mound Street PCB Site.	Project No.: 010865-370303	Mound Street PCB Site St. Louis, Missouri	Photograph Location Map	Figure No.: A-1
		SVERDRUP		5/96

Photographic Record

Site Name: **Mound Street PCB Site**
Site Location: **St. Louis, Missouri**
CERCLIS ID No.: **MO0000093682**
Sverdrup Project Reference No.: **010865-370303**

Sverdrup

No. 1 (Roll 1, Photos 5 and 6)

Description: East view photomosaic of the site from the western border of the site. Note the PFT-Apex Oil tanks and flood wall in the background.

Photographer: M. McCurdy Witness: K. Harris Date: December 6, 1995

Photographic Record

Site Name: **Mound Street PCB Site**
Site Location: **St. Louis, Missouri**
CERCLIS ID No.: **MO0000093682**
Sverdrup Project Reference No.: **010865-370303**

Sverdrup

No. 2 (Roll 1, Photo 1)

Description: Northwest view of the site from the southeast corner of the site. Note the debris piles in the background.

Photographer:
M. McCurdy

Witness: K. Harris

Date: December 6, 1995

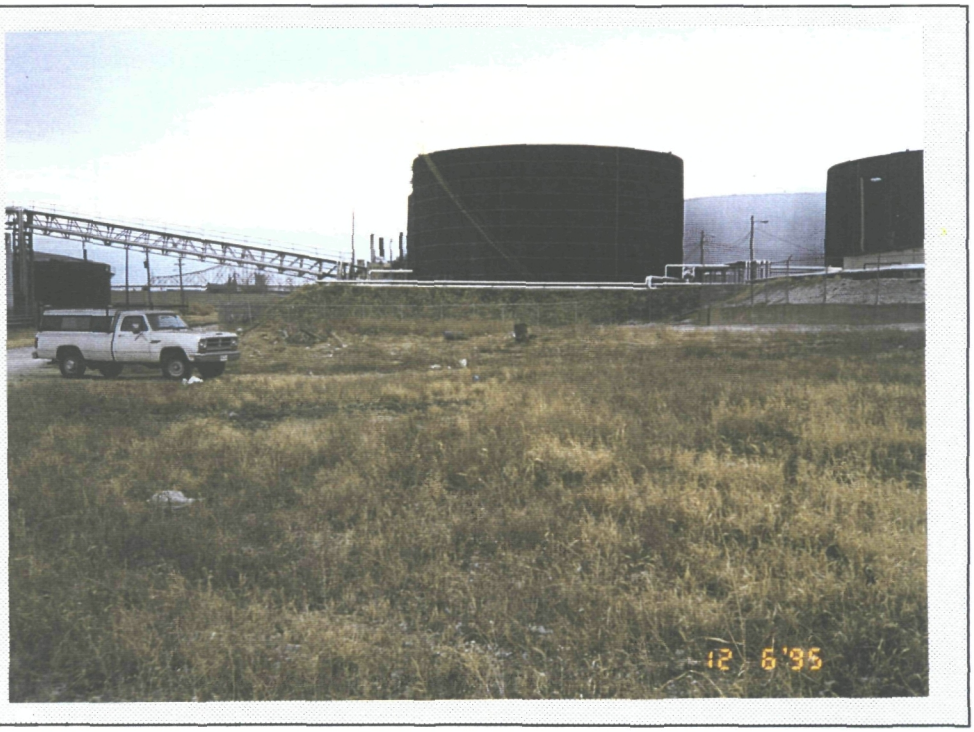
No. 3 (Roll 1, Photo 4)

Description: South view of the site from the northern edge showing vegetative cover. Note the PFT-Apex Oil tanks in the background.

Photographer:
M. McCurdy

Witness: K. Harris

Date: December 6, 1995



Photographic Record

Site Name: **Mound Street PCB Site**
Site Location: **St. Louis, Missouri**
CERCLIS ID No.: **MO0000093682**
Sverdrup Project Reference No.: **010865-370303**

Sverdrup

No. 4 (Roll 1, Photo 11)

Description: North view along gravel road and along flood wall showing the MSD pump station.

Photographer:
M. McCurdy

Witness: K. Harris

Date: December 6, 1995

No. 5 (Roll 1, Photo 7)

Description: North view showing the TRRA property from which an UST was removed in 1993.

Photographer:
M. McCurdy

Witness: K. Harris

Date: December 6, 1995

Photographic Record

Site Name: **Mound Street PCB Site**
Site Location: **St. Louis, Missouri**
CERCLIS ID No.: **MO0000093682**
Sverdrup Project Reference No.: **010865-370303**

Sverdrup

No. 6 (Roll 1, Photo 12)

Description: West view of the site from near the flood wall showing the site topography. Note the PFT-Apex Oil facility in the background

Photographer:
M. McCurdy

Witness: K. Harris

Date: December 6, 1995

No. 7 (Roll 1, Photo 14)

Description: Northwest view showing the South Well.

Photographer:
M. McCurdy

Witness: K. Harris

Date: December 6, 1995

Photographic Record

Site Name: **Mound Street PCB Site**
Site Location: **St. Louis, Missouri**
CERCLIS ID No.: **MO0000093682**
Sverdrup Project Reference No.: **010865-370303**

Sverdrup

No. 8 (Roll 1, Photo 13)

Description: West view showing the north well on Petroleum, Fuel and Terminal property.

Photographer:
M. McCurdy

Witness: K. Harris

Date: December 6, 1995

Photographic Record

Site Name: **Mound Street PCB Site**
Site Location: **St. Louis, Missouri**
CERCLIS ID No.: **MO0000093682**
Sverdrup Project Reference No.: **010865-370303**

Sverdrup

No. 9 (Roll 2, Photo 2)

Description: Northwest view showing the location of soil sample DC1CY-101 at the southeast corner of the site. Note the debris piles in the background.

Photographer: M. May

Witness: M. McCurdy

Date: April 3, 1996

Photographic Record

Site Name: **Mound Street PCB Site**
Site Location: **St. Louis, Missouri**
CERCLIS ID No.: **MO0000093682**
Sverdrup Project Reference No.: **010865-370303**

Sverdrup

No. 10 (Roll 2, Photo 21)

Description: Southwest view showing the vacant property where soil samples DC1CY-100/100D, 102, 103 and 104 were collected. This property is east of the site, near the flood wall.

Photographer: M. May

Witness: M. McCurdy

Date: April 3, 1996

Photographic Record

Site Name: **Mound Street PCB Site**
Site Location: **St. Louis, Missouri**
CERCLIS ID No.: **MO0000093682**
Sverdrup Project Reference No.: **010865-370303**

Sverdrup

No. 11 (Roll 2, Photo 9)

Description: South view showing the location of sample DC1CY-100/100D near the PFT-Apex Oil tanks adjacent to the flood wall.

Photographer: M. May

Witness: M. McCurdy

Date: April 3, 1996

Photographic Record

Site Name: **Mound Street PCB Site**
Site Location: **St. Louis, Missouri**
CERCLIS ID No.: **MO0000093682**
Sverdrup Project Reference No.: **010865-370303**

Sverdrup

No. 12 (Roll 2, Photo 24)

Description: East view across the Mississippi River showing the Illinois-American Surface Water Intake Pump House. Taken from the flood wall gate at Mullanphy Street.

Photographer: M. May

Witness: M. McCurdy

Date: April 3, 1996

Photographic Record

Site Name: **Mound Street PCB Site**
Site Location: **St. Louis, Missouri**
CERCLIS ID No.: **MO0000093682**
Sverdrup Project Reference No.: **010865-370303**

Sverdrup

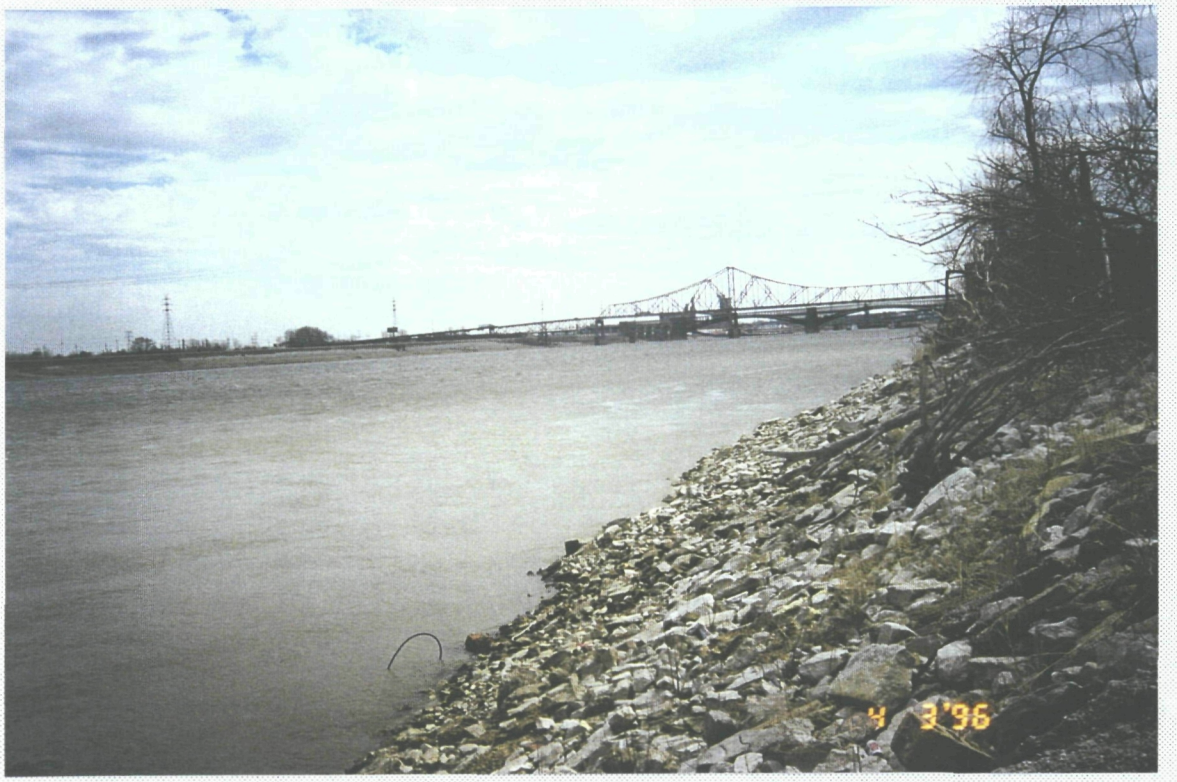
No. 13 (Roll 2, Photo 23)

Description: South view showing the Mississippi River. Note the M.L. King Bridge and Eads Bridge in the background. The Illinois-American surface water intake pump house is off the picture to the left. Taken from the flood wall gate at Mullanphy Street.

Photographer: M. May

Witness: M. McCurdy

Date: April 3, 1996



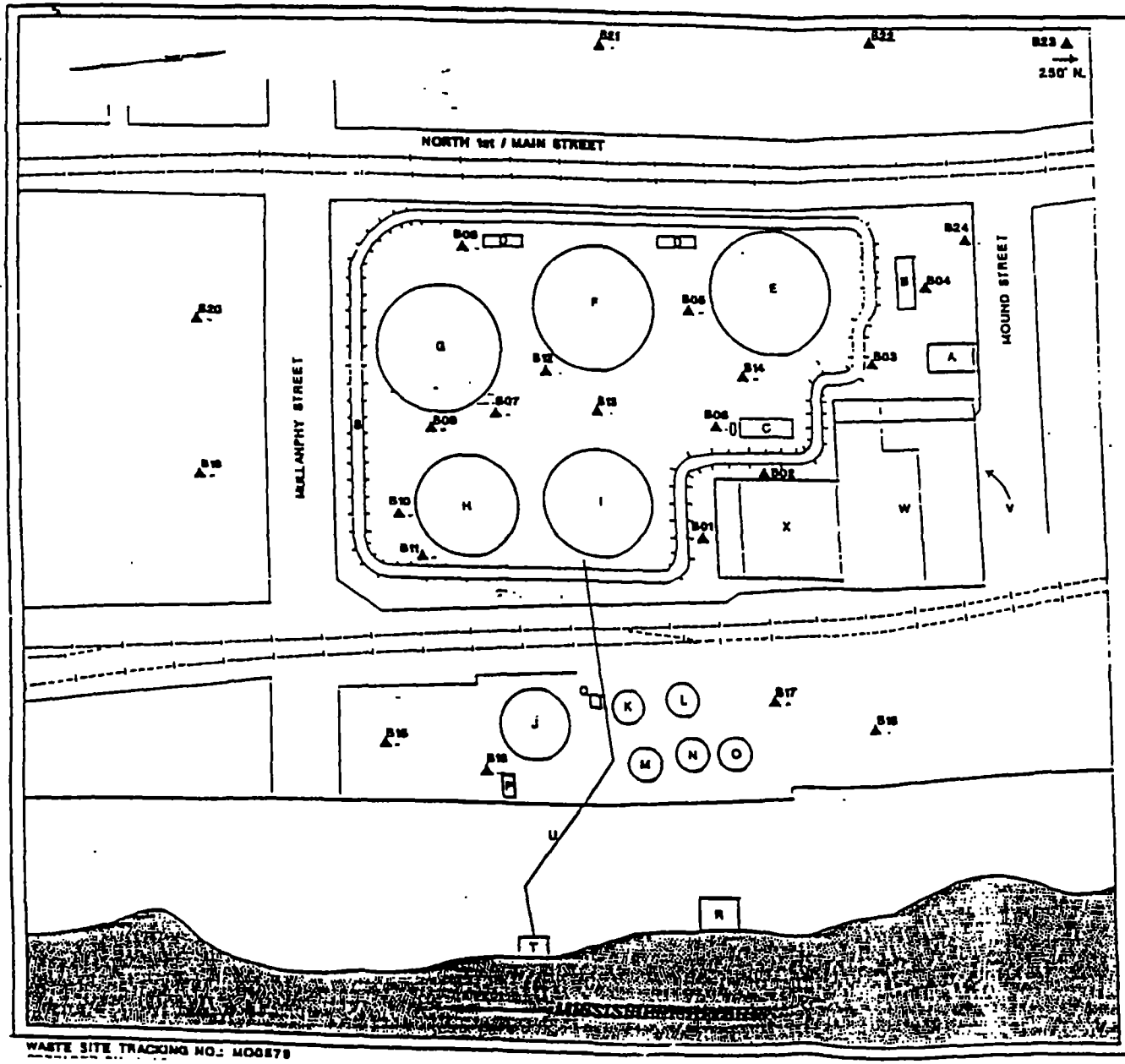
SECTION 6: FIELD ACTIVITIES

Field work was conducted March 3 through 9, 1991. The sample series assigned to this activity was DSX44. The FIT members and their respective tasks were: Keith Brown, Team Leader; Anne Melia, PASP coordinator; Chris Williams, Geoprobe operator and sampler; Patty Roberts, Assistant Geoprobe operator and sampler; Wes McCall, drilling supervisor and Site Safety Officer; John Peck, sampler and health and safety monitor; and Jon Strobel, sampler and assistant PASP coordinator. The FIT contracted John Mathes & Associates, Inc. to conduct all subsurface drilling. On-site personnel for John Mathes & Associates, Inc. were: Keith Bunselmyer, driller; and Jeff Crank and Jim Burker, driller's assistants. Additionally, William Oberle and Jacalyn Wheeler, E & E/FIT, were present on site March 6 and 7, 1991, to conduct a health and safety, and technical field audits.

The primary chemical hazards associated with the Laclede Coal Gas site involve soils contaminated with cyanide salts and/or PAHs. These materials could pose inhalation, direct contact, and ingestion hazards. Samples were collected in level-D and level-C personal protection. An HNu photo-ionization detector with 10.2 eV probe was used to monitor ambient levels of volatile compounds in the breathing zone. If the HNu registered readings above predetermined action levels, personal protection was upgraded to level-C. Otherwise, samples were collected in level-D personal protection.

6.1 SUBSURFACE SOIL SAMPLING

Subsurface soil sampling was conducted March 4 through 9, in an attempt to determine the areal and vertical extent of subsurface contamination. Initially, 24 locations were drilled with solid stem augers (Figure 6-1; Table 6-1). Their depths ranged from 2 feet to 38 feet. Originally, the work plan called for 18 locations to be drilled with solid stem augers to approximately 20 foot depths, with the exception of 1 location which was to be drilled to 50 feet deep. This deep sample was intended to determine the depth to bedrock and help assess the vertical contaminant zone. The 6 additional locations were added because subsurface rubble prohibited the advancement of the augers



EXPLANATION

APEX OIL COMPANY
ST. LOUIS TERMINAL STRUCTURES

- A. OFFICE
- B. TANKER TRUCK LOADING PLATFORM
- C. EQUIPMENT SHED
- D. EQUIPMENT/WORK SHOP
- E. FUEL OIL TANK (80,000 Barrels)
- F. FUEL OIL TANK (80,000 Barrels)
- G. FUEL OIL TANK (80,000 Barrels)
- H. FUEL OIL TANK (80,000 Barrels)
- I. FUEL OIL TANK (55,000 Barrels)
- J. OIL TANK
- K. CRUDE OIL TANK
- L. CRUDE OIL TANK
- M. CRUDE OIL TANK
- N. CRUDE OIL TANK
- O. CRUDE OIL TANK
- P. PUMP HOUSE
- Q. PUMP HOUSE
- R. PUMP HOUSE (Abandoned)
- S. CONTAINMENT BERM
  (For Fuel Oil Tanks, Capped With A Chain-link Fence)
- T. PUMP HOUSE
- U. RIVER TANKER OFF-LOADING PIPES

FORMER UNION ELECTRIC
MOUND ST. FACILITY

- V. FORMER UNION ELECTRIC BUILDING
- W. GENERATOR ROOM (Basement Plan)
- X. BOILER ROOM (Basement Plan)

B01 ▲ BORE HOLE (SCREENING) SAMPLE LOCATION

LACLEDE COAL GAS SITE
ST. LOUIS, MISSOURI
(PRESENT DAY CONFIGURATION)

FIGURE 6-1
SOIL BORING LOCATION MAP

SCALE
0 200
FEET

WASTE SITE TRACKING NO.: MO0579

EIT MAY 1

Table 6-1
Borehole Summary
Laclede Coal Gas
St. Louis, Missouri
Sample Series DSX44
March 1991

Borehole #	Depth (ft)	Approximate Location
B01	18	South of former Mound Street Power Plant
B02	21	Southwest of former Mound Street Power Plant
B03	19	South of P, F, & T Office
B04	19	North of tanker truck loading platform
B05	26	Approximately 15 feet south of northern-most fuel oil tank
B06	38	North of center of site within containment berm
B07	29	South of center of site within containment berm
B08	--	Southwest corner of site within containment berm
B09	--	South of center of site within containment berm
B10	--	Southeast corner of site within containment berm
B11	15	Southeast corner of site within containment berm
B12	11	Center of site within containment berm
B13	10	Center of site within containment berm
B14	26	North center of site within containment berm
B15	31	Southeast corner of site
B16		Southeast corner of site approximately 100 feet north of B15
B17	33	Northeast corner of site
B18	33	Northeast corner of site approximately 150 north of B17
B19	30	South of Mullanphy Street
B20	30	South of Mullanphy Street approximately 200 feet north of B19
B21	--	Approximately 80 feet north of North 1st Street
B22	--	Approximately 300 feet north of B21
B23	--	Approximately 450 feet north of B22
B24	23	Northeast corner of site

Note: See Figure 6-1 for borehole locations.

at several locations to only a few feet and, therefore, a representative sample could not be collected.

Samples were collected off the auger flights and screened on site for PAHs and VOCs in the FASP mobile laboratory (Tables 6-2 and 6-3). The samples were collected at 5 foot intervals: the PAH sample was a composite of 5 aliquots, 1 collected every foot; the VOC sample was a grab sample. Four of the sample locations determined by FASP analysis to be the most contaminated were resampled as follows: hollow stem augers equipped with continuous samplers were advanced, offset 1 to 5 feet from the screening boring (Figure 6-2, Table 6-4). A background location was sampled in the same manner. Due to subsurface rubble and debris, the continuous sampler could not be utilized at all locations. A split spoon sampler equipped with a 140 pound hammer was used at locations where the continuous sampler would not work. Samples were collected according to E & E, Inc. Standard Operation Procedures (SOPs) for borehole sampling, Gentech 5.9. Samples from the 4 locations that were resampled were submitted to EPA for volatiles, semi-volatiles, cyanides, and total metals analysis.

The background samples were inadvertently discarded along with the screening samples. This was not discovered by FIT until the SSI was completed and the team had returned to Kansas City. Split samples had been collected at all locations where samples were submitted to the EPA and which were also on PF & T property. Kathy Enright, of E & E/TAT in St. Louis, Missouri, sent the split samples collected for PF & T to E & E's Kansas City office. These samples were once again split, and 1 set was submitted to EPA to be used as the background sample. The other set was returned to PF & T.

The background samples were collected at a different location than stated in the work plan because bedrock was encountered at approximately 2 feet below the surface at this location; therefore, subsurface soil samples could not be collected there. FASP analysis had revealed that borehole #B24, the farthest upgradient screening sample, was below detection limits for all target compounds. It was known that the depth to bedrock was approximately 20 feet. Therefore, E & E/FIT relocated

Table 6-2
FASP Screening Results for Volatiles
LaClede Coal Gas
St. Louis, Missouri
Sample Series DSX44
March 1991

Sample #	Benzene (µg/kg)	Toluene (µg/kg)	M-xylene (µg/kg)	Depth (feet)
B01 A	1,200	380	1,700	0 - 5
B01 B	9,100	1,200	19,000	5 - 10
B01 C	18,000	710	65,000	10 - 15
B01 D	17,000	770	79,000	15 - 18
B02 A	6,300	43,000	240,000	0 - 5
B02 B	6,100	1,700	57,000	5 - 10
B02 C	69,000	110,000	570,000	10 - 15
B02 D	7,500	650	33,000	15 - 21
B03 A	1,040	22,000	22,000	0 - 5
B03 B	310	11,000	53,000	5 - 10
B03 C	1,800	6,300	3,500	10 - 15
B03 D	860	9,000	5,300	15 - 19
B04 A	< 250	450	5,600	0 - 5
B04 B	310	480	5,900	5 - 10
B04 C	< 250	250	5,100	10 - 15
B04 D	< 250	ND	440	15 - 19
B05 A	460	ND	ND	0 - 5
B05 B	ND	ND	ND	5 - 10
B05 C	ND	ND	420	10 - 15
B05 D	ND	ND	410	15 - 20
B05 E	ND	ND	ND	20 - 26
B06 A	48,000	1,700	120,000	0 - 5
B06 B	20,000	1,800	68,000	8 - 10
B06 BA	93,000	120,000	220,000	0 - 5
B06 BB	27,000	91,000	260,000	5 - 10
B06 BC	ND	ND	ND	10 - 15
B06 BD	< 250	< 250	ND	15 - 20
B06 BE	12,000	14,000	54,000	20 - 25
B06 BF	43,000	66,000	23,000	25 - 30
B06 BG	20,000	16,000	26,000	30 - 35
B06 BH	29,000	43,000	94,000	35 - 38
B07 A	1,000,000	17,000	2,500,000	3 - 8
B07 B	670,000	12,000	2,100,000	8 - 13
B07 C	370,000	ND	> 1,200,000	13 - 18
B07 D	140,000	2,500	> 21,000,000	18 - 23
B07 E	22,000	490	120,000	23 - 26
B07 F	51,000	2,800	340,000	26 - 29
B10 B	< 250	410	ND	5 - 10
B11 A	ND	ND	ND	0 - 5

Table 6-2 (cont.)

Sample #	Benzene (µg/kg)	Toluene (µg/kg)	M-xylene (µg/kg)	Depth (feet)
B11 B	ND	ND	ND	5 - 10
B11 C	ND	ND	ND	10 - 15
B12 A	< 250	< 250	1,500	0 - 5
B12 B	910	1,600	4,400	5 - 11
B13 A	570	420	< 250	0 - 5
B13 B	670	450	2,300	5 - 10
B14 A	270,000	11,000	> 160,000	2 - 8
B14 B	790	9,100	> 24,000	8 - 13
B14 C	400,000	14,000	> 160,000	13 - 18
B14 D	340,000	12,000	> 210,000	18 - 23
B14 E	310,000	8,900	> 195,000	23 - 26
B14 F	2,200,000	63,000	> 1,000,000	---
B14 SS	93,000	110,000	440,000	---
B15 A	680	490	> 29,000	0 - 5
B15 B	290	ND	10,000	5 - 10
B15 C	< 250	ND	7,400	10 - 15
B15 D	< 250	ND	2,700	15 - 20
B15 E	ND	ND	ND	20 - 25
B15 F	ND	ND	ND	25 - 31
B16 A	820	860	15,000	0 - 3
B17 A	540	ND	21,000	0 - 5
B17 B	ND	ND	2,700	5 - 10
B17 C	ND	ND	ND	10 - 15
B17 D	ND	ND	ND	15 - 20
B17 E	ND	ND	ND	20 - 25
B17 F	ND	ND	ND	25 - 30
B17 G	ND	ND	ND	30 - 33
B18 A	< 250	ND	ND	0 - 5
B18 B	ND	ND	ND	5 - 10
B18 C	ND	ND	ND	10 - 15
B18 D	ND	ND	ND	15 - 20
B18 E	ND	ND	ND	20 - 25
B18 F	ND	ND	ND	25 - 30
B18 G	ND	ND	ND	30 - 33
B19 A	ND	ND	ND	0 - 5
B19 B	ND	ND	ND	5 - 10
B19 C	ND	ND	ND	10 - 15
B19 D	ND	ND	ND	15 - 20
B19 E	ND	ND	ND	20 - 25
B19 F	ND	ND	ND	25 - 30
B20 A	320	ND	ND	0 - 5
B20 B	ND	ND	ND	5 - 10
B20 C	ND	ND	ND	10 - 15
B20 D	ND	ND	ND	15 - 20

Table 6-2 (cont.)

Sample #	Benzene (µg/kg)	Toluene (µg/kg)	M-xylene (µg/kg)	Depth (feet)
B20 E	ND	ND	ND	20 - 25
B20 F	ND	ND	ND	25 - 30
B22 A	ND	ND	ND	---
B23 A	ND	ND	ND	0 - 4
B24 A	ND	ND	ND	0 - 5
B24 B	ND	ND	ND	5 - 10
B24 C	< 250	ND	ND	10 - 15
B24 D	400	ND	550	15 - 20
B24 E	460	ND	430	20 - 23
401	ND	ND	ND	N/A
402	ND	ND	1,600	N/A
403	< 250	< 250	420	N/A
301	ND	ND	ND	N/A
302	ND	ND	ND	N/A
303	ND	ND	ND	N/A
304	ND	ND	ND	N/A
DW 1	188	77	1,000	N/A
DW 2	330	48	1,100	N/A
CDW	ND	ND	ND	N/A
SS-Rinsate	ND	ND	ND	N/A

Note: Detection limit for soil/sediment samples = 250 µg/kg. Detection limit for water samples = 25 µg/L. See Figures 6-1 and 6-2 for sample locations.

B01 A through B24 E = soil samples
401 through 403 = sediment samples
301 through 304 = surface water samples
DW = decon water (units are µg/L)
CDW = clean decon water
ND = no detection
N/A = not applicable
SS = split spoon

Table 6-3
FASP Screening Results for PAHs
LaClede Coal Gas
St. Louis, Missouri
Sample Series DSX44
March 1991
Reported in µg/kg

Sample #	Fluor-anthene	Pyrene	Benzo(k) fluoranthene	Benzo(a) pyrene	Comments
B01 A	16,000	3,700	NA	NA	
B01 B	27,000	12,000	NA	NA	
B01 C	56,000	40,000	NA	NA	
B01 D	13,000	5,200	NA	NA	
B02 A	8,000	ND	ND	ND	
B02 B	15,000	ND	ND	ND	
B02 C	ND	ND	ND	ND	
B02 D	ND	ND	ND	ND	
B03 A	ND	ND	ND	ND	
B03 B	ND	ND	ND	ND	
B03 C	ND	ND	ND	ND	
B03 D	ND	ND	ND	ND	
B04 A	ND	ND	ND	ND	
B04 B	12,000	ND	ND	ND	
B04 C	9,000	ND	ND	ND	
B04 D	< 500	ND	ND	ND	chyrsene & benzo(a) anthracene = 1,200
B05 A	ND	ND	ND	ND	
B05 B	ND	ND	ND	ND	
B05 C	ND	ND	ND	ND	
B05 D	ND	ND	ND	ND	two unknown peaks
B05 E	ND	ND	ND	ND	
B06 A	55,000	110,000	54,000	40,000	anaphthalene, fluorene, anthracene, chrysene
B06 B	Blew out GC, peaks too large to integrate				
B06 BA	ND	ND	ND	ND	
B06 BB	ND	ND	ND	ND	
B06 BC	ND	ND	32,000	11,000	other identified peaks
B06 BD	ND	ND	ND	ND	
B06 BE	ND	ND	ND	ND	
B06 BF	ND	ND	ND	ND	
B06 BG	ND	ND	ND	ND	
B06 BH	17,000	ND	ND	ND	
B07 A	Peaks too large to integrate, no time to reanalyze				
B07 B	160,000	50,000	50,000	70,000	other PAHs present
B07 C	130,000	130,000	33,000	76,000	other PAHs present
B07 D	12,000	9,600	3,700	3,900	
B07 E	3,300	3,800	3,500	3,000	other PAHs present
B07 F	20,000	19,000	4,200	8,000	other PAHs present
B10 B	14,000	16,000	7,800	9,100	other PAHs present

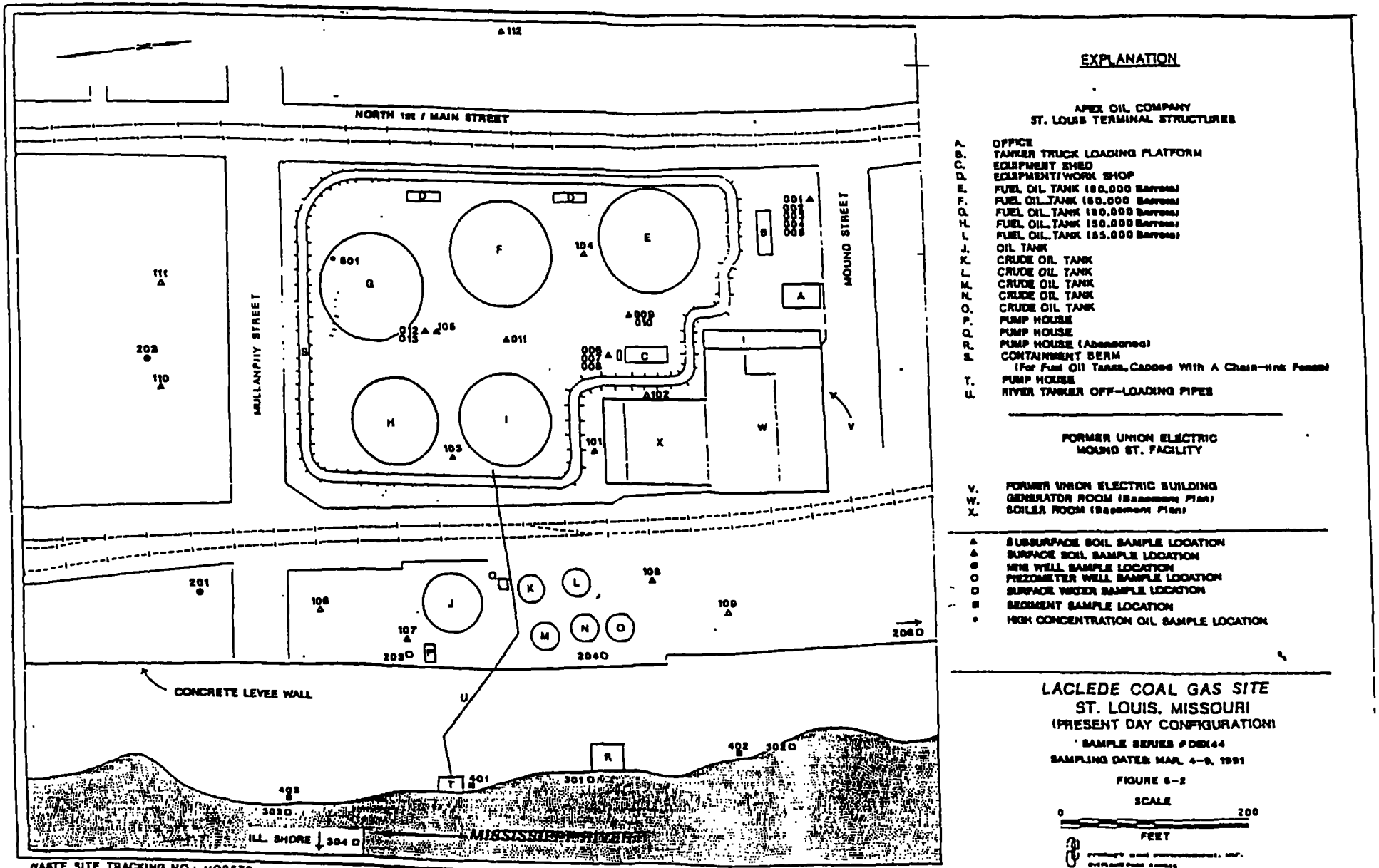
Table 6-3 (cont.)

B11 A	2,400	1,600	4,200	ND	other PAHs present
B11 B	?,100	2,100	7,000	10,000	other PAHs present
B11 C	7,800	ND	6,000	12,000	
B12 A	14,000	12,000	14,000	15,000	
B12 B	38,000	29,000	12,000	15,000	
B13 A	150,000	73,000	46,000	44,000	
B13 B	12,000	10,000	10,000	12,000	
B13 C	32,000	34,000	28,000	32,000	
B14 A	1,600,000	580,000	280,000	63,000	other identified peak
B14 B	2,200,000	1,000,000	370,000	310,000	other identified peak
B14 C	4,200,000	1,600,000	1,200,000		other identified peak
B14 D	4,300,000	1,300,000	490,000		other identified peak
B14 E	3,200,000	4,100,000	1,500,000	140,000	other identified peak
B14 F	Blew out GC, peaks too large to integrate				
B14 SS	1,400,000	880,000	230,000	130,000	
B15 A	ND	ND	ND	ND	
B15 B	4,900	1,300	ND	ND	
B15 C	ND	ND	ND	ND	
B15 D	ND	ND	ND	ND	
B15 E	ND	ND	ND	ND	
B15 F	ND	ND	ND	ND	
B16 A	19,000	30,000	ND	ND	early peaks
B17 A	ND	ND	ND	ND	
B17 B	ND	ND	ND	ND	
B17 C	ND	< 500	ND	ND	
B17 D	ND	ND	ND	ND	
B17 E	ND	ND	ND	ND	
B17 F	ND	ND	ND	ND	
B18 A	ND	ND	ND	ND	
B18 B	ND	ND	ND	ND	
B18 C	ND	ND	ND	ND	
B18 D	ND	ND	ND	ND	
B18 E	ND	ND	ND	ND	
B18 F	ND	ND	ND	ND	
B18 G	ND	ND	ND	ND	
B19 A	ND	ND	ND	ND	
B19 B	ND	ND	ND	ND	
B19 C	ND	ND	ND	ND	
B19 D	ND	ND	ND	ND	
B19 E	18,000	16,000	14,000	12,000	
B19 F	4,500	ND	2,800	ND	
B20 A	ND	2,900	< 500	ND	
B20 B	4,100	4,000	ND	545	
B20 C	ND	ND	ND	ND	
B20 D	ND	ND	ND	ND	
B20 E	ND	ND	ND	ND	
B20 F	2,600	3,200	3,500	4,500	
B22 A	3,800	3,500	2,800	ND	

Table 6-3 (cont.)

B23 A	ND	ND	ND	ND	
501	--	--	--	--	peaks close to retention time, but do not match
402	ND	ND	ND	ND	
403	2,600	5,400	4,200	3,800	
DDW	ND	ND	ND	ND	no peaks (µg/L)
SS Rinsate	ND	ND	ND	ND	no peaks (µg/L)
B24 A	ND	ND	ND	ND	
B24 B	ND	ND	ND	ND	
B24 C	ND	ND	ND	ND	
B24 D	ND	ND	ND	ND	
B24 E	ND	ND	ND	ND	

Note: Sample locations are shown on Figures 6-1 and 6-2. Sample 501 is an oil sample collected from tank #7, shown on Figure 6-2. Detection limits for soil/sediment = 500 µg/kg. Detection limits for water samples = 15 µg/l.
DDW = dirty decon water
SS = split spoon
NA = not analyzed
ND = not detected



WASTE SITE TRACKING NO.: M00579
PREPARED BY: K. BROWN

FIT MAY 1991

Table 6-4
CLP Soil/Sediment Sample Summary
LaClede Coal Gas
St. Louis, Missouri
Sample Series DSX44
March 1991

Sample #	Depth (feet)	Location Description
001	3 - 7	5 feet northwest of B24
002	7 - 11	5 feet northwest of B24
003	11 - 15	5 feet northwest of B24
004	15 - 19	5 feet northwest of B24
005	19 - 23	5 feet northwest of B24
006	3 - 8	2.5 feet north of B06
007	8 - 13	2.5 feet north of B06
008	8 - 12	2 feet south of B06
009	4 - 8	3 feet northwest of B14
010	12 - 14	3 feet northwest of B14
011	11 - 17	1.5 feet vest of B07
012	5 - 11	1 foot north of B13
013	11 - 12.5	1 foot north of B13
101	0 - 2	B01
102	0 - 2	B02
103	0 - 2	South central tank farm
104	0 - 2	B05
105	0 - 2	B07
106	0 - 2	B15
107	0 - 2	B16
108	0 - 2	B17
109	0 - 2	B18
110	0 - 2	B19
111	0 - 2	B20
112	0 - 2	B21
401	N/A	150 feet south of southeast corner of the abandoned pump house
401D	N/A	150 feet south of southeast corner of the abandoned pump house
402	N/A	110 feet north of northeast corner of the abandoned pump house
403	N/A	330 feet south of southeast corner of the abandoned pump house

Note: Samples 001 through 013 collected from five aliquots, except VOCs were grab samples. Samples 101 through 112 collected from two aliquots. All samples were submitted to EPA for cyanide, semi-volatiles, and total metals analyses. Samples 001 through 113 and 401 through 403 were also analyzed for volatiles. Samples 401 through 403 were also analyzed for total petroleum hydrocarbons. See Figure 6-2 for sample locations.

D = Duplicate

N/A = Not applicable

the background sample location to the farthest northwest corner of PF & T property. This location is approximately 60 feet northwest (upgradient) of borehole #B04 (Figure 6-1).

6.2 SURFACE SOIL SAMPLING

Surface soil sampling was conducted March 4 through 7, to determine whether contamination was present in the 0- to 2-foot interval. Twelve samples were collected (Figure 6-2, Table 6-4). According to the work plan, these samples were to be collected using a power auger. However, due to excessive amounts of gravel and rubble present, the power auger could not be used efficiently. Therefore, all but one surface soil sample was collected with the subcontractor's drill rig.

Each sample was collected off the auger flights and consisted of two aliquots collected from one- and two-foot depths. The sample not collected with the drill rig was obtained with the use of the power auger. Three of the 12 surface soil samples collected, 110, 111, and 112, were inadvertently discarded along with the screening samples. Keith Brown and Scott Hayes returned to the site on March 13 and 14 and recollected these samples with a power auger. All samples were submitted to EPA for semi-volatile, cyanide, and total metals analyses. Samples were collected in accordance with the Region VII E & E/FIT SOP for soil sample collection, Geotech 5.17.

6.3 GROUND WATER SAMPLING

Ground water sampling was conducted March 5 through 9, to determine whether any coal tar wastes present have leached into the shallow ground water or migrated off site via the ground water. A total of 9 samples, including a duplicate, field blank, rinsate, and extra volume sample were collected (Figure 6-2, Table 6-5). The work plan called for the installation of 4 temporary mini-wells with the Geoprobe. Due to sub-surface rubble, only 2 mini-wells were installed. However, the Corps of Engineers (COE) has installed piezometer wells along the west side of the Mississippi River levee wall. The COE wells located just east of the site were sampled with the use of the Geoprobe vacuum system. One other COE piezometer well was sampled; it is located approximately 1,500 feet north (upgradient) of the site along the levee wall. This location

Table 6-5
Water Sampling Summary
LaClede Coal Gas
St. Louis, Missouri
Sample Series DSX44
March 1991

Sample #	Depth (feet)	Static Water Level (SWL) (feet)	Location/Description
201	26	24	64 feet south from center of Mullanphy Street and 50 feet east of easternmost railroad
202	33	24	147 feet west of easternmost railroad and 78 feet south of center of Mullanphy Street
203	47.25	27.25	147 feet north of center of Mullanphy Street and 40 feet west of levee wall
204	48	26	363 feet north of center of Mullanphy Street and 25 feet west of levee wall
205F	N/A	N/A	Rinsate of augers and split spoon sampler
206	52	29	2,118 feet north of center of Mullanphy Street and 20 feet west of levee wall
206D			Duplicate of 206
207F	N/A	N/A	Field Blank
208	N/A	N/A	Geoprobe pipe rinsate sample
209F	N/A	N/A	Trip blank
301	Surface	N/A	Southeast corner of abandoned pump house
301D	Duplicate of above		
302	Surface	N/A	170 feet north of northeast corner of abandoned pump house
303	Surface	N/A	330 feet south of southeast corner of abandoned pump house
304	Surface	N/A	Illinois American drinking water intake in East St. Louis
304D			Duplicate of 304
501	Surface	N/A	Oil sample collected from PF & T tank #80-1

Note: See legend on next page.

Legend for Table 6-5

Note: Sample locations are shown on Figure 6-2. All water samples were submitted to EPA for volatiles, semi-volatiles, and total and dissolved metals analyses. Samples 301 through 304D were also analyzed for Total Petroleum Hydrocarbons. Sample #501 is an oil sample which was submitted to EPA for Total Petroleum Hydrocarbons, volatiles, and semi-volatiles analyses. Cyanide samples were preserved with sodium hydroxide. Metals samples were preserved with nitric acid.

D = duplicate
F = field blank or trip blank
N/A = not applicable

was chosen for the ground water background sample. The original background location could not be sampled because bedrock was only 2 feet deep. All samples were collected following the E & E Region VII SOP for ground water collection, Gentech 5.11. Total and dissolved metals samples were preserved with nitric acid; cyanide samples were preserved with sodium hydroxide; and all samples were stored on ice. Samples were delivered to EPA for volatiles, semi-volatiles, cyanide, total metals, and dissolved metals analyses. The field parameters, temperature, pH, and conductivity were measured and recorded in the field (Table 6-6).

6.4 SURFACE WATER/SEDIMENT SAMPLING

Surface water/sediment sampling was conducted March 6 through 7 to determine whether contaminants have migrated via the ground water/surface water interface. A total of 6 surface water samples were collected, including 2 duplicates (Figure 6-2, Table 6-5). All samples were collected according to the EPA Region VII SOP for surface water sample collection, 2334.7A. Samples were submitted to EPA for Total Petroleum Hydrocarbons, volatiles, semi-volatiles, cyanide, total metals, and dissolved metals analyses. Total and dissolved metals samples were preserved with nitric acid, cyanide samples were preserved with sodium hydroxide, and all samples were stored on ice. The field parameters temperature, pH, and conductivity, were measured and recorded in the field (Table 6-6).

A total of 4 sediment samples were collected, including a duplicate (Figure 6-2, Table 6-4). All samples were collected according to the EPA Region VII SOP for sediment sample collection, 2334.8A. Samples were submitted to EPA for Total Petroleum Hydrocarbons, volatiles, semi-volatiles, cyanide, and total metals analyses. Surface water and sediment samples were screened on site in the mobile lab for the presence of PAHs and VOCs (Tables 6-2 and 6-3).

6.5 PRODUCT SAMPLING

One oil sample was to be collected from the basement of the former Mound Street Power Plant, if the building was standing and oil was present in the basement. At the time of the SSI, the building was in the process of being razed. Due to the danger involved with entering

Table 6-6
Field Parameters for Water Samples
LaClede Coal Gas
St. Louis, Missouri
Sample Series DSX44
March 1991

Sample #	Temperature (C°)	pH	Conductivity (umhos)
301	7	8.15	440
301D	7	8.15	440
302	6	7.87	450
303	6	7.27	360
304	3	7.05	350
304D	3	7.05	350
201	11	7.58	1,500
202	7	7.81	2,000
203	9	6.32	1,500
204	9	6.21	1,400
206	11	6.14	1,600
206D	11	6.14	1,600
207F	--	---	--
208	4	7.00	16
209F	--	----	--

Note: See Figure 6-2 for sample locations.

this building, the sample was not collected. However, an oil sample (sample 501) was collected from an 80,000-gallon tank on site (Figure 6-2). This tank contained #6 oil, the same type of oil that was spilled in 1986 and entered the basement of the former power plant. This oil sample was submitted to EPA for total petroleum hydrocarbons, VOCs, and semi-volatiles analyses. It was also screened on site in the mobile lab. The chromatogram peaks were close to the retention times for the contaminants being screened, but did not match (Table 6-3).

SECTION 7: ANALYTICAL RESULTS

7.1 SURFACE SOIL SAMPLES (0-2 FEET)

The surface soil (0-2 feet) sampling data indicated that the majority of the 7-acre site is significantly contaminated with cyanide at greater than three times the detection limit of the background sample 112 (Figure 6-2; Table 7-1). Analysis of off site samples 110, 111, and 112 revealed no cyanide contamination over their detection limits of 6.2, 6.2, and 6.7, respectively (Figure 6-2).

Surface soil PAH contamination was less extensive than the surface soil cyanide contamination. Four out of the 12 samples collected contained a total PAH content greater than five times the concentration of the background sample. These were samples 104, 105, 107 and 109 (Figure 6-2; Table 7-1).

The cyanide contamination found on site can be attributed to the FMGP based on the fact that cyanide is an oxide waste produced during the gas purification process (see Section 4 for details). There should not be any attribution from current on site activities, because cyanide is not a constituent normally found in oil or asphalt.

Attribution of PAH contamination in the surface soil samples is difficult to assess. The oil sample data indicated significant concentrations of many PAH compounds (Appendix D, Sample 501). PF & T currently stores #6 oil and asphalt on site in very large quantities. In 1986, PF & T experienced a spill of said oil which covered most of the site. Thus, surface soil PAH contamination could be attributed to PF & T activities or to the FMGP, based on the fact that it was common practice for FMGPs to bury tar and purifier waste on site. PAHs are a major constituent of coal tar vaste.

7.2 SUBSURFACE SOIL SAMPLES

FASP screening results indicated that the highest PAH contamination zone was located in the central portion of the tank farm currently on site (Figure 6-1; Tables 6-2 and 6-3). The approved work plan allowed E & E/FIT to collect CLP subsurface soil samples at four locations. A total of eight samples (006-013) were collected at depths ranging from 3

Table 7-1
PAHs and Cyanide In Surface Soils
Laclede Coal Gas Site
St. Louis, Missouri
E & E/FIT; March 1991
Sample Series DSX44
(mg/kg)

Compound	101	102	103	104	105	106	107	108	109	110	111	112*
Napthalene	--	--	--	--	--	--	60	1.1	0.51	--	--	0.41U
2-Methylnaphthalene	--	--	--	--	--	--	13	2.5	--	--	--	0.41U
2-Chloronaphthalene	--	--	--	--	--	--	--	--	--	--	--	0.41U
Acenaphthylene	--	--	--	--	--	--	--	2.4	0.46	--	--	0.41U
Acenaphthene	--	--	--	--	--	--	--	0.69	--	--	--	0.41U
Fluorene	--	--	--	--	12	--	--	3.1	--	--	--	0.41U
Phenanthrene	--	--	--	20	55	1.5	--	--	2.2	1.5	0.85	0.44
Anthracene	--	--	--	--	--	--	--	--	0.78	--	--	0.41U
Fluoranthene	--	--	--	14	38	2.0	--	--	2.8	2.2	0.77	1.3
Pyrene	--	21	13	50	83	2.2	--	--	6.7	2.3	0.81	1.4
Benzo(a)anthracene	--	--	--	21	28	1.3	--	--	4.5	1.5	0.48	0.79
Chrysene	--	--	--	29	29	1.2	--	--	4.3	1.6	0.55	0.85
Benzo(b)fluoranthene	--	--	--	--	17	1.0	--	--	4.9	1.1	0.44	0.61
Benzo(k)fluroanthene	--	--	--	--	12	0.89	--	--	3.4	1.2	0.45	0.68
Benzo(a)pyrene	--	--	--	16	22	1.1	--	--	4.2	1.3	0.44	0.70
Indeno(1,2,3-CD) Pyrene	--	--	--	--	--	0.66	--	--	2.7	0.76	--	0.41U
Dibenzo(a,h)anthracene	--	--	--	--	--	--	--	--	--	--	--	0.41U
Dibenzo(g,h,i)perylene	--	--	--	--	12	0.71	--	--	2.6	0.76	--	0.41U
Total PAH Content	--	21	13	150	308	12.5	73	9.8	40.0	14.2	4.8	6.8
Cyanide	33	--	94	220	190	--	14	98	35	--	--	6.7U

* = Background sample
-- = Undetected (U); Detection limit stated for bckground sample.

Note: See Figure 6-2 for sample locations and Appendix D for complete analytical results.

to 17 feet. An additional five samples (001-005) were collected at a background location (Figure 6-2; Table 6-4). CLP data revealed significant PAH contamination at least five times greater than background concentration at all four sampling locations (Table 7-2). Cyanide contamination was found to be significant to a depth of 11+ feet (Table 7-2).

All the soil samples were also analyzed for total and dissolved metals, as well as volatiles. However, results proved to be negligible when compared to background concentrations with the exception of significant concentrations of benzene, toluene, ethyl benzene, and total xylenes (BTEX) in samples 006 through 011 (except no toluene in sample 011). Significant benzene was also detected in sample 013. Styrene (14J µg/kg) was detected in sample 012.

As was the case with the surface soil samples, the cyanide contamination can be attributed to the FMGP. It is probable that the deep soil PAH contamination came from both the FMGP and the petroleum tank farm. The presence of mixed BTEX compounds and PAHs indicates a mixed source, as volatiles are not considered abundant in coal tar.

7.3 GROUND WATER SAMPLES

Ground water sampling data indicated no significant dissolved metals contamination when compared to background concentrations. Some organics were detected; however, in sample 204, piezometer well located downgradient of the site. This sample contained 3 PAHs: acenapthalene (65 µg/L), fluorene (25 µg/L), and phenanthene (46 µg/L); and 93 µg/L benzene (Figure 6-2; Appendix C). Additionally, cyanide was detected in all ground water samples at concentrations above the 17 µg/L detection limit: 520J µg/L in sample 201, 27J µg/L in sample 202, 590J µg/L in sample 203, and 1,600J µg/L in sample 204. Cyanide was not detected in the background sample.

7.4 SURFACE WATER AND SEDIMENT SAMPLES

Surface water and sediment was sampled at three locations downgradient of the site. Additionally, the East St. Louis raw water intake, located across the Mississippi River from the site was sampled

Table 7-2
PAHs and Cyanide in Subsurface Soil Samples
and Product Sample
Laclede Coal Gas Site
St. Louis, Missouri
E & E/FIT; March 1991
Sample Series DSX44
(mg/kg)

Compound	(2-7') 001*	(7-11') 002*	(11-15') 003*	(17-21') 004*	(19-23') 005*	(3-8') 006	(8-13') 007	(8-12') 008	(4-8') 009	(12-14') 010	(11-17') 011	(5-11') 012	(11-12.5') 013	501
Naphthalene	--	0.40U	--	--	--	23	87	2200	68	0.89	30	--	55	700
2-methylnaphthalene	--	0.40U	--	--	--	80	43	69	84	0.98	23	--	--	4000
2-chloronapththalene	--	0.40U	--	--	--	--	--	--	--	--	--	--	--	450
Acenaphthylene	--	0.40U	--	--	--	--	--	15	--	--	20	--	--	450
Acenaphtene	--	0.40U	--	--	--	--	--	32	12	0.15	15	--	22	620
Fluorene	--	0.40U	--	--	--	20	--	J	13	0.17	24	--	21	830
Phenanthrene	1.4	0.40U	--	--	--	63	20	J	46	0.51	71	--	59	4300
Anthracene	0.38	0.40U	--	--	--	--	--	J	--	--	23	--	18	810
Fluoranthene	2.0	0.52	0.54	--	--	--	--	--	--	--	180	--	39	620
Pyrene	2.8	0.53	0.80	--	--	48	J	J	J	J	J	--	65	2800
Benzo(a)anthracene	1.8	0.40U	--	--	--	18	--	J	--	--	99	--	21	1600
Chrysene	1.8	0.40U	0.44	--	--	18	--	J	16	0.18	94	--	21	2700
Benzo(b) fluoranthene	1.6	0.40U	--	--	--	--	--	61	--	--	76	--	15	--
Benzo(k)fluoranthene	1.4	0.40U	--	--	--	--	--	52	--	--	89	--	17	--
Benzo(a)pyrene	1.5	0.40U	--	--	--	--	--	95	--	--	120	--	23	970
Indeno(1,2,3-CD) pyrene	0.93	0.40U	--	--	--	--	--	37	--	--	75	--	--	--
Dibenzo(a,h)anthracene	--	0.40U	--	--	--	--	--	--	--	--	--	--	--	--
Dibenzo(g,h,i)perylene	1.2	0.40U	--	--	--	--	--	44	--	--	68	--	--	--
Total PAH Content	16.8	1.1	1.8	--	--	270	150	2605	239	2.9	1027	--	376	20,850
Cyanide	26	24	--	--	--	87	180	860	--	48	250	170	--	--

* = Background sample
-- = Undetected (U) with detection limit given for background sample 002.
J = Detected, but results are invalid.

Note: See Figure 6-2 for sample locations and Appendix D for complete analytical results.

(304 and 304D). The most upgradient of these samples (302 and 402) generally exhibited the most contamination, though concentrations are fairly comparable (Tables 7-3 and 7-4). An exception is total chromium (12-14 µg/L), lead (15-18 µg/L), and zinc (46-54 µg/L) detected in samples 304 and 304D, collected from the surface water intake. These metals were not detected in the dissolved fraction of these samples. The only organics deteced in these samples are relatively low levels of PAHs and cyanide found in the sediment samples (Table 7-4). A background sediment and surface water sample was not collected, so that no comparisonn to background can be made for these metals. However, sample concentrations are relatively low as compared to other samples collected.

7.5 PRODUCT SAMPLE

The oil sample (501) collected from an 80,000-gallon tank (Figure 2-3, tank #7) contained significant concentrations of many PAHs (Table 7-2). Attribution of PAH contamination on site is very difficult to assess, based on the fact that in 1986, PF & T experienced a spill of the same oil (#6) which was sampled, over the entire site. It was also common practice for FMGPs to bury their tar wastes on site. PAHs are a major constitudent of coal tar wastes. Thus, surface and subsurface soil PAH contamination could be attributable to either PF & T activities or the FMGP.

Table 7-3
Selected Total Metals
Sediment and Surface Water Samples
Laclede Coal Gas Site
St. Louis, Missouri
E & E/FIT; March 1991
Sample Series DSX44

Sample #	As	Ba	Cu	Cr	Ni	Pb	Se	V	Zn
				Sediment Samples (mg/kg)					
401	3.7	140	9.1	8.7	10	30J	--.--	15	35J
401D	4.0	140	8.2	9.0	11	13J	--.--	17	36J
402	8.4	160	26	16	18	36J	2.0J	27	77J
403	7.1	160	23	12	16	31J	--.--	25	64J
				Water Samples (µg/L)					
301	--.--	--.--	--.--	--.--	--.--	7.0	--.--	--.--	--.--
301D	--.--	--.--	--.--	--.--	--.--	7.2	--.--	--.--	--.--
302	--.--	--.--	--.--	--.--	--.--	9.7	--.--	--.--	--.--
303	--.--	280	--.--	--.--	--.--	24U	I*	62	89U
304	--.--	--.--	--.--	14	--.--	18	--.--	--.--	54
304D	--.--	--.--	--.--	12	--.--	15	--.--	--.--	--.--

* = Invalid analysis, but 11 µg/L dissolved selenium was detected in this sample.
U = Undetected; detection limit given if above detected values.
J = Results are reported, but invalid by approved QC procedures.

Note: See Figure 6-2 for sample locations and Appendix D for complete analytical results.

Table 7-4
PAHs, Cyanide, and Total Hydrocarbons
Sediment Samples
Laclede Coal Gas Site
St. Louis, Missouri
E & E/FIT; March 1991
Sample Series DSX44

(µg/kg)	401	401D	402	403
Phenanthene	---	---	2900	4400
Fluoranthene	---	750	5000	5100
Pyrene	---	960	8000	6400J
Benzo(a)anthracene	---	460	3500	4200
Di-n-octyl phthalate	--	470	3900	4900
Benzo(k)fluoranthene	---	---	2900	3100
Benzo(a)pyrene	---	430	2600	5600
Benzo(GHI)perylene	---	---	3500	4100
Cyanide	---	---	1600	---
Total hydrocarbons	3100	3100U	8200	4900

J = Results are reported, but invalid by approved QC procedures.
U = Undetected, with detection limit given.
--- Indicated undetected with detection limits below detected values.

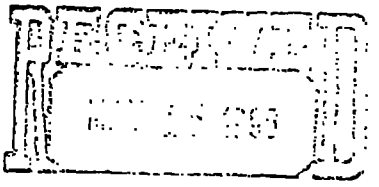
Note: See Figure 6-2 for sample locations and Appendix D for complete analytical results.

APPENDIX C

EPA ANALYTICAL DATA REPORT

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 7
25 FUNSTON ROAD
KANSAS CITY, KANSAS 66115



DATE: May 3 1996

SUBJECT: Data Transmittal for Activity #: DCICY
Site Description: Mound Street PCBs

FROM: Andrea Jirka, Program Manager
Regional Laboratory, Environmental Services Division

TO: Dave Crawford
SUPR

Attached is the data transmittal for the above-referenced site. The data contained in this transmittal have been approved by the Regional Laboratory. This should be considered a ____ Partial or X Complete data transmittal (completes transmittal of _____). The Project Leader should notify the Regional Laboratory with 14 days of any changes in the LAST analytical database. If you have any questions, comments, or data changes, please contact Dee Simmons at 551-5129.

Attachment

cc: Analytical Data File

DRAFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

FY: 96 ACTNO: DC1CY SAMNO: 001 QCC: _ MEDIA: WATER PL: TAPIA, CECILIA

ACTIVITY DES: MOUND STREET PCBS REF LATITUDE: __ __ __
LOCATION: ST. LOUIS MO PROJECT NUM: L33 PT: LONGITUDE: __ __ __

SAMPLE DES: South well water
LOCATION: St Louis MO
CASE/BATCH/SMO: ____/__/____ LAB: ___
STORET/AIRS NO: _____

	DATE	TIME	FROM REF PT
BEG:	4/3/96	12:15	EAST: ____
END:	4/3/96	13:35	NORTH: ____
			DOWN: ____

ANALYSIS REQUESTED:

CONTAINER	PRESERVATIVE	MGP	NAME
2-40 ML VIALS	HCL +COOL (4 C)	WV	WATER VOLATILES
GLASS	ICED	WS	SEMIVOLATILES
GLASS	ICED	W24	PCB - G. BEEMONT
GLASS	ICED	W24	PCB - G. BEEMONT

COMMENTS: FOR SUPERFUND ONLY: SUBSITE IDENTIFIER:___ OPERABLE UNIT:___

SAMPLE COLLECTED BY : Michael W McCurdy

DRAFT

FIELD SHEET
U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

FY: 96 ACTNO: DC1CY SAMNO: 001 QCC: D MEDIA: WATER PL: TAPIA, CECILIA

ACTIVITY DES: MOUND STREET PCBS REF LATITUDE: __ __ __
LOCATION: ST. LOUIS MO PROJECT NUM: L33 PT: LONGITUDE: __ __ __

SAMPLE DES: DUPLICATE/SAMPLE 001 DATE TIME FROM REF PT
LOCATION: St Louis MO BEG: 4/3/96 12:15 EAST: ____
CASE/BATCH/SMO: ____/__/____ LAB: ___ END: 4/3/96 13:35 NORTH: ____
STORET/AIRS NO: ____ DOWN: ____

ANALYSIS REQUESTED:

CONTAINER	PRESERVATIVE	MGP	NAME
GLASS	ICED	WS	SEMIVOLATILES
2-40 ML VIALS	HCL +COOL (4 C)	WV	WATER VOLATILES
GLASS	ICED	W24	PCB - G. BEEMONT
GLASS	ICED	W24	PCB - G. BEEMONT

COMMENTS: FOR SUPERFUND ONLY: SUBSITE IDENTIFIER:___ OPERABLE UNIT:___

SAMPLE COLLECTED BY : Michael W McCurdy

DRAFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

FY: 96 ACTNO: DC1CY SAMNO: 002 QCC: _ MEDIA: WATER PL: TAPIA, CECILIA

ACTIVITY DES: MOUND STREET PCBS REF LATITUDE: __ __ __
LOCATION: ST. LOUIS MO PROJECT NUM: L33 PT: LONGITUDE: __ __ __

SAMPLE DES: North well water
LOCATION: St Louis MO
CASE/BATCH/SMO: ____/__/____ LAB: ___
STORET/AIRS NO: _____

	DATE	TIME	FROM REF PT
BEG:	4/3/96	12:15	EAST: ____
END:	4/3/96	12:45	NORTH: ____
			DOWN: ____

ANALYSIS REQUESTED:

CONTAINER	PRESERVATIVE	MGP	NAME
2-40 ML VIALS	HCL +COOL (4 C)	WV	WATER VOLATILES
GLASS	ICED	WS	SEMIVOLATILES
GLASS	ICED	W24	PCB - G. BEEMONT
GLASS	ICED	W24	PCB - G. BEEMONT

COMMENTS: FOR SUPERFUND ONLY: SUBSITE IDENTIFIER:___ OPERABLE UNIT:___

SAMPLE COLLECTED BY : Michael W McCurdy

DRAFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

FY: 96 ACTNO: DC1CY SAMNO: 003 QCC: F MEDIA: WATER PL: TAPIA, CECILIA

ACTIVITY DES: MOUND STREET PCBS REF LATITUDE: __ __ __
LOCATION: ST. LOUIS MO PROJECT NUM: L33 PT: LONGITUDE: __ __ __

SAMPLE DES: Field Blank
LOCATION: St Louis MO
CASE/BATCH/SMO: / / LAB:
STORET/AIRS NO:

	DATE	TIME	FROM REF PT
BEG:	4/3/96	9:15	EAST:
END:	4/3/96	9:15	NORTH:
			DOWN:

ANALYSIS REQUESTED:

CONTAINER	PRESERVATIVE	MGP	NAME
2-40 ML VIALS	HCL +COOL (4 C)	WV	WATER VOLATILES
GLASS	ICED	WS	SEMIVOLATILES
GLASS	ICED	W24	PCB - G. BEEMONT
GLASS	ICED	W24	PCB - G. BEEMONT

COMMENTS: FOR SUPERFUND ONLY: SUBSITE IDENTIFIER: OPERABLE UNIT:

Sample did not have "F" QC code RSCC added upon sample receipt. m 4/4/96

SAMPLE COLLECTED BY : Michael McCurdy

DRAFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

FY: 96 ACTNO: DC1CY SAMNO: 007 QCC: F MEDIA: WATER PL: TAPIA, CECILIA

ACTIVITY DES: MOUND STREET PCBS REF LATITUDE: __ __ __
LOCATION: ST. LOUIS MO PROJECT NUM: L33 PT: LONGITUDE: __ __ __

SAMPLE DES: TRIP BLANK DATE TIME FROM REF PT
LOCATION: St Louis MO BEG: __/__/__ __:__ EAST: ____
CASE/BATCH/SMO: ____/__/____ LAB: ___ END: __/__/__ __:__ NORTH: ____
STORET/AIRS NO: ____ DOWN: ____

ANALYSIS REQUESTED:

CONTAINER	PRESERVATIVE	MGP	NAME
2-40 ML VIALS	HCL +COOL (4 C)	WV	WATER VOLATILES

OK

COMMENTS: FOR SUPERFUND ONLY: SUBSITE IDENTIFIER: ___ OPERABLE UNIT: ___

Sample Used - PR

Sample collected in field
No Sample prepared by EPA

Sample vials Not labeled!

Contacted field personnel & noted on F.S. & ccc PR 4/6/

DO not write this on Field Sheet. PR

SAMPLE COLLECTED BY : Michael W McCurdy

DRAFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

FY: 96 ACTNO: DC1CY SAMNO: 008 QCC: _ MEDIA: WATER PL: TAPIA, CECILIA

ACTIVITY DES: MOUND STREET PCBS REF LATITUDE: __ __ __
LOCATION: ST. LOUIS MO PROJECT NUM: L33 PT: LONGITUDE: __ __ __

SAMPLE DES: RINSATE DATE TIME FROM REF PT
LOCATION: St Louis MO BEG: 4/2/96 16:10 EAST: ____
CASE/BATCH/SMO: ____/__/____ LAB: ___ END: 4/2/96 16:20 NORTH: ____
STORET/AIRS NO: _____ DOWN: ____

ANALYSIS REQUESTED:

CONTAINER	PRESERVATIVE	MGP	NAME
GLASS	ICED	WS	SEMIVOLATILES
2-40 ML VIALS	HCL +COOL (4 C)	WV	WATER VOLATILES
GLASS	ICED	W24	PCB - G. BEEMONT
GLASS	ICED	W24	PCB - G. BEEMONT

COMMENTS: FOR SUPERFUND ONLY: SUBSITE IDENTIFIER:___ OPERABLE UNIT:___

SAMPLE COLLECTED BY : Michael W McCurdy

DRAFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

FY: 96 ACTNO: DC1CY SAMNO: 100 QCC: _ MEDIA: SOIL PL: TAPIA, CECILIA

ACTIVITY DES: MOUND STREET PCBS REF LATITUDE: __ __ __
LOCATION: ST. LOUIS MO PROJECT NUM: L33 PT: LONGITUDE: __ __ __

SAMPLE DES: Grab the soil
LOCATION: St Louis MO
CASE/BATCH/SMO: / / LAB:
STORET/AIRS NO:

	DATE	TIME	FROM REF PT
BEG:	4/2/96	15:50	EAST:
END:	4/2/96	16:00	NORTH:
			DOWN:

ANALYSIS REQUESTED:

CONTAINER	PRESERVATIVE	MGP	NAME
GLASS	ICED	SS	SEMIVOLATILES
2-40 ML VIALS	COOL (4 C)	SV	SOIL VOLATILES
GLASS	ICED	S16	PCB'S - G. BEEMONT

Mid (86%) solids

COMMENTS: FOR SUPERFUND ONLY: SUBSITE IDENTIFIER:___ OPERABLE UNIT:___

SAMPLE COLLECTED BY : Michael W McCurdy

DRAFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

FY: 96 ACTNO: DC1CY SAMNO: 100 QCC: D MEDIA: SOIL PL: TAPIA, CECILIA

ACTIVITY DES: MOUND STREET PCBS REF LATITUDE: __ __ __
LOCATION: ST. LOUIS MO PROJECT NUM: L33 PT: LONGITUDE: __ __ __

SAMPLE DES: DUPLICATE/SAMPLE 100 DATE TIME FROM REF PT
LOCATION: St Louis MO BEG: 4/2/96 16:00 EAST: ____
CASE/BATCH/SMO: ____/__/____ LAB: ___ END: 4/2/96 16:10 NORTH: ____
STORET/AIRS NO: ____ DOWN: ____

ANALYSIS REQUESTED:

CONTAINER	PRESERVATIVE	MGP	NAME
2-40 ML VIALS	COOL (4 C)	SV	SOIL VOLATILES
GLASS	ICED	SS	SEMIVOLATILES
GLASS	ICED	S16	PCB'S - G. BEEMONT

Add (SG07)% solids

COMMENTS: FOR SUPERFUND ONLY: SUBSITE IDENTIFIER:___ OPERABLE UNIT:___

SAMPLE COLLECTED BY : Michael W McCurdy

DRAFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

FY: 96 ACTNO: DC1CY SAMNO: 101 QCC: _ MEDIA: SOIL PL: TAPIA, CECILIA

ACTIVITY DES: MOUND STREET PCBS REF LATITUDE: __ __ __
LOCATION: ST. LOUIS MO PROJECT NUM: L33 PT: LONGITUDE: __ __ __

SAMPLE DES: Geoprobe soil
LOCATION: St Louis MO
CASE/BATCH/SMO: ____/_/____ LAB: ___
STORET/AIRS NO: _____

	DATE	TIME	FROM REF PT
BEG:	4/2/96	10:55	EAST: ____
END:	4/2/96	11:05	NORTH: ____
			DOWN: ____

ANALYSIS REQUESTED:

CONTAINER	PRESERVATIVE	MGP	NAME
GLASS	ICED	SS	SEMIVOLATILES
2-40 ML VIALS	COOL (4 C)	SV	SOIL VOLATILES
GLASS	ICED	S16	PCB'S - G. BEEMONT

Add (SG07)% solids

COMMENTS: FOR SUPERFUND ONLY: SUBSITE IDENTIFIER: ___ OPERABLE UNIT: ___

SAMPLE COLLECTED BY : Michael W McCurdy

DRAFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

FY: 96 ACTNO: DC1CY SAMNO: 102 QCC: _ MEDIA: SOIL PL: TAPIA, CECILIA

ACTIVITY DES: MOUND STREET PCBS REF LATITUDE: __ __ __
LOCATION: ST. LOUIS MO PROJECT NUM: L33 PT: LONGITUDE: __ __ __

SAMPLE DES: Geo.probe soil
LOCATION: St Louis MO
CASE/BATCH/SMO: / / LAB:
STORET/AIRS NO:

	DATE	TIME	FROM REF PT
BEG:	4/2/96	15:00	EAST:
END:	4/2/96	15:15	NORTH:
			DOWN:

ANALYSIS REQUESTED:

CONTAINER	PRESERVATIVE	MGP	NAME
GLASS	ICED	SS	SEMIVOLATILES
2-40 ML VIALS	COOL (4 C)	SV	SOIL VOLATILES
GLASS	ICED	S16	PCB'S - G. BEEMONT

Add (SG07)% solids

COMMENTS: FOR SUPERFUND ONLY: SUBSITE IDENTIFIER:___ OPERABLE UNIT:___

SAMPLE COLLECTED BY : Michael W McCurdy

DRAFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

FY: 96 ACTNO: DC1CY SAMNO: 103 QCC: _ MEDIA: SOIL PL: TAPIA, CECILIA

ACTIVITY DES: MOUND STREET PCBS REF LATITUDE: __ __ __
LOCATION: ST. LOUIS MO PROJECT NUM: L33 PT: LONGITUDE: __ __ __

SAMPLE DES: Composite Soil
LOCATION: St Louis MO
CASE/BATCH/SMO: / / LAB:
STORET/AIRS NO:

	DATE	TIME	FROM REF PT
BEG:	4/2/96	15:15	EAST:
END:	4/2/96	15:30	NORTH:
			DOWN:

ANALYSIS REQUESTED:

CONTAINER	PRESERVATIVE	MGP	NAME
GLASS	ICED	SS	SEMIVOLATILES
2-40 ML VIALS	COOL (4 C)	SV	SOIL VOLATILES
GLASS	ICED	S16	PCB'S - G. BEEMONT

Add (SC07)% solids

COMMENTS: FOR SUPERFUND ONLY: SUBSITE IDENTIFIER: ___ OPERABLE UNIT: ___

SAMPLE COLLECTED BY : Michael W McCurdy

DRAFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

FY: 96 ACTNO: DC1CY SAMNO: 104 QCC: _ MEDIA: SOIL PL: TAPIA, CECILIA

ACTIVITY DES: MOUND STREET PCBS REF LATITUDE: __ __ __
LOCATION: ST. LOUIS MO PROJECT NUM: L33 PT: LONGITUDE: __ __ __

SAMPLE DES: Geoprobe boring
LOCATION: St Louis MO
CASE/BATCH/SMO: / /
STORET/AIRS NO:
LAB:

	DATE	TIME	FROM REF PT
BEG:	4/3/96	9:15	EAST:
END:	4/3/96	9:30	NORTH:
			DOWN:

ANALYSIS REQUESTED:

CONTAINER	PRESERVATIVE	MGP	NAME
GLASS	ICED	SS	SEMIVOLATILES
2-40 ML VIALS	COOL (4 C)	SV	SOIL VOLATILES
GLASS	ICED	S16	PCB'S - G. BEEMONT

Add (SG07)% solids

COMMENTS: FOR SUPERFUND ONLY: SUBSITE IDENTIFIER:___ OPERABLE UNIT:___

SAMPLE COLLECTED BY : Michael W McCurdy

DRAFT

FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

FY: 96 ACTNO: DC1CY SAMNO: 108 QCC: F MEDIA: SOIL PL: TAPIA, CECILIA

ACTIVITY DES: MOUND STREET PCBS REF LATITUDE: __ __ __
LOCATION: ST. LOUIS MO PROJECT NUM: L33 PT: LONGITUDE: __ __ __

SAMPLE DES: TRIP BLANK DATE TIME FROM REF PT
LOCATION: St Louis MO BEG: __/__/__ __:__ EAST: ____
CASE/BATCH/SMO: ____/__/____ LAB: ___ END: __/__/__ __:__ NORTH: ____
STORET/AIRS NO: ____ DOWN: ____

ANALYSIS REQUESTED:

CONTAINER	PRESERVATIVE	MGP	NAME
2-40 ML VIALS	COOL (4 C)	SV	SOIL VOLATILES

VOA
% Solid

Add (8607)% solids

COMMENTS: FOR SUPERFUND ONLY: SUBSITE IDENTIFIER:___ OPERABLE UNIT:___

Sample used.

No sample collected in field prepared by EPA

Sample vials not labeled!

Contacted field personnel & noted on F.S. & COC 4/4/96 m

Do not write this on field sheet! m

SAMPLE COLLECTED BY : Michael W McCurdy

M 4/5/96

CHAIN OF CUSTODY RECORD
ENVIRONMENTAL PROTECTION AGENCY REGION VII

ACTIVITY LEADER(Print)	NAME OF SURVEY OR ACTIVITY	DATE OF COLLECTION (DAY / MONTH / YEAR)	SHEET
Michael McCurdy	Mound Street PCB	2 / 4 / 96	1 of 2

CONTENTS OF SHIPMENT

SAMPLE NUMBER	TYPE OF CONTAINERS: 8 oz CUBITAINER	80 oz BOTTLE	BOTTLE	BOTTLE	VOA SET (2 VIALS EA)	SAMPLED MEDIA: water	soil	sediment	dust	other	RECEIVING LABORATORY REMARKS: OTHER INFORMATION (condition of samples upon receipt, other sample numbers etc.)
	NUMBERS OF CONTAINERS PER SAMPLE NUMBER										
DC1CY100	2				1		X				
DC1CY100D	2				1		X				
DC1CY101	2				1		X				
DC1CY102	2				1		X				
DC1CY103	2				1		X				
DC1CY008		4			1	X					
DC1CY007F					*1	X					HCL preservative also included in one of the coolers
DC1CY108F					*1		X				(Total of 5 coolers for 2 days)

Sample kinds were not labeled. RSCA labeled trials upon sample receipt.
M 4/4/96

Copy Rec'd

DESCRIPTION OF SHIPMENT

____ PIECE(S) CONSISTING OF ____ BOX(ES)

2 ICE CHEST(S); OTHER ____

MODE OF SHIPMENT

____ COMMERCIAL CARRIER ____

____ COURIER

X SAMPLER CONVEYED (SHIPPING DOCUMENT NUMBER)

PERSONNEL CUSTODY RECORD

4/4/96 11:33

RELINQUISHED BY (SAMPLER)	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
Michael W McCurdy ☐ SEALED ☒ UNSEALED	4/4/96	11:33	☐ SEALED ☒ UNSEALED	analyze
RELINQUISHED BY ☐ SEALED ☐ UNSEALED	DATE	TIME	RECEIVED BY ☐ SEALED ☐ UNSEALED	REASON FOR CHANGE OF CUSTODY
RELINQUISHED BY	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY

CHAIN OF CUSTODY RECORD
ENVIRONMENTAL PROTECTION AGENCY REGION VII

ACTIVITY LEADER(Print)	NAME OF SURVEY OR ACTIVITY	DATE OF COLLECTION (DAY / MONTH / YEAR)	SHEET
Michael McCurdy	Mound Street PCB	3 / 4 / 96	2 of 2

CONTENTS OF SHIPMENT

SAMPLE NUMBER	TYPE OF CONTAINERS: 8 oz CUBITAINER	80 oz BOTTLE	BOTTLE	BOTTLE	VOA SET (2 VIALS EA)	SAMPLED MEDIA: water	soil	sediment	dust	other	RECEIVING LABORATORY REMARKS:OTHER INFORMATION (condition of samples upon receipt, other sample numbers, etc.)
	NUMBERS OF CONTAINERS PER SAMPLE NUMBER										
DCICY 104	2				1		X				
DCICY 001		4			1	X					
DCICY 001D		4			1	X					
DCICY 002		4			1	X					Air Bubbles in both vials. Some samples are also in one of the coolers from 4/2/96 (total 5 coolers for RSCC added 1/2 days)
DCICY 003 FB		4			1	X					This sample was not correctly identified as a field blank. Comp Co to samples + field sheets.

DESCRIPTION OF SHIPMENT

____ PIECE(S) CONSISTING OF ____ BOX(ES)

3 ICE CHEST(S): OTHER ____

MODE OF SHIPMENT

____ COMMERCIAL CARRIER: ____

____ COURIER

X SAMPLER CONVEYED (SHIPPING DOCUMENT NUMBER)

PERSONNEL CUSTODY RECORD

RELINQUISHED BY (SAMPLER)	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
Michael W McCurdy ☐ SEALED ☐ UNSEALED X	4/4/96	11:33	Sam Jacks ☐ SEALED ☐ UNSEALED X	analyze
RELINQUISHED BY ☐ SEALED ☐ UNSEALED	DATE	TIME	RECEIVED BY ☐ SEALED ☐ UNSEALED	REASON FOR CHANGE OF CUSTODY
RELINQUISHED BY ☐ SEALED ☐ UNSEALED	DATE	TIME	RECEIVED BY ☐ SEALED ☐ UNSEALED	REASON FOR CHANGE OF CUSTODY

4/4/96 1:33

ANALYSIS REQUEST REPORT

VALIDATED DATA

FOR ACTIVITY: DC1CY

TAPIA, CECILIA

05/03/96 16:55:08

ALL REAL SAMPLES AND FIELD Q.C.

INAL REPORT

: 96 ACTIVITY: DC1CY DESCRIPTION: MOUND STREET PCBS LOCATION: ST. LOUIS MISSOURI

STATUS: ACTIVE TYPE: SAMPLING - IN HOUSE ANALYSIS PROJECT: L33

BO DUE DATE IS 5/ 4/96. REPORT DUE DATE IS 6/ 2/96.

ISPECTION DATE: 4/ 3/96 ALL SAMPLES RECEIVED DATE: 04/04/96

L DATA APPROVED BY LABO DATE: 05/03/96 FINAL REPORT TRANSMITTED DATE: 05/03/96

PECTED LABO TURNAROUND TIME IS 30 DAYS EXPECTED REPORT TURNAROUND TIME IS 60 DAYS

TUAL LABO TURNAROUND TIME IS 29 DAYS ACTUAL REPORT TURNAROUND TIME IS 30 DAYS

TE CODE: CY SITE: MOUND STREET POWER STATION

P.	QCC	M	DESCRIPTION	SAMPLE STATUS	#	CITY	STATE	AIRS/ STORET LOC	NO	SECT	LAY-ER	BEG. DATE	BEG. TIME	END. DATE	END. TIME
1		W	SOUTH WELL WATER	1		ST. LOUIS	MISSOURI					04/03/96	12:15	04/03/96	13:35
1	D	W	SOUTH WELL WATER/DUPLICATE	1		ST. LOUIS	MISSOURI					04/03/96	12:15	04/03/96	13:35
2		W	NORTH WELL WATER	1		ST. LOUIS	MISSOURI					04/03/96	12:15	04/03/96	12:45
3	F	W	FIELD BLANK	1		ST. LOUIS	MISSOURI					04/03/96	09:15	04/30/96	09:25
7	F	W	TRIP BLANK	1		ST. LOUIS	MISSOURI					00/00/00	00:00	00/00/00	00:00
8		W	RINSATE	1		ST. LOUIS	MISSOURI					04/02/96	16:10	04/02/96	16:20
0		S	GEOPROBE SOIL	1		ST. LOUIS	MISSOURI					04/02/96	15:50	04/02/96	16:00
0	D	S	GEOPROBE SOIL/DUPLICATE	1		ST. LOUIS	MISSOURI					04/02/96	16:00	04/02/96	16:10
1		S	GEOPROBE SOIL	1		ST. LOUIS	MISSOURI					04/02/96	10:55	04/02/96	11:05
2		S	GEOPROBE SOIL	1		ST. LOUIS	MISSOURI					04/02/96	15:00	04/02/96	15:15
3		S	GEOPROBE SOIL	1		ST. LOUIS	MISSOURI					04/02/96	15:15	04/02/96	15:30
4		S	GEOPROBE BORING	1		ST. LOUIS	MISSOURI					04/03/96	09:15	04/03/96	09:30
8	F	S	TRIP BLANK	1		ST. LOUIS	MISSOURI					00/00/00	00:00	00/00/00	00:00

EXPLANATION OF CODES AND INFORMATION ON ANALYSIS REQUEST DETAIL REPORT

PLE INFORMATION:

P. NO. = SAMPLE IDENTIFICATION NUMBER (A 3-DIGIT NUMBER WHICH IN COMBINATION WITH THE ACTIVITY NUMBER AND QCC, PROVIDES AN UNIQUE NUMBER FOR EACH SAMPLE FOR IDENTIFICATION PURPOSES)

= QUALITY CONTROL CODE (A ONE-LETTER CODE USED TO DESIGNATE SPECIFIC QC SAMPLES. THIS FIELD WILL BE BLANK FOR ALL NON-QC OR ACTUAL SAMPLES):

- B = CAL INCREASED CONCENTRATION FOR A LAB SPIKED DUP SAMPLE
- D = MEASURED VALUE FOR FIELD DUPLICATE SAMPLE
- F = MEASURED VALUE FOR FIELD BLANK
- G = MEASURED VALUE FOR METHOD STANDARD
- H = TRUE VALUE FOR METHOD STANDARD
- K = CAL INCREASED CONCENTRATION FOR FIELD SPIKED DUP SAMPLE
- L = MEASURED VALUE FOR A LAB DUPLICATE SAMPLE
- M = MEASURED VALUE FOR LAB BLANK
- N = MEASURED CONCENTRATION OF FIELD SPIKED DUPLICATE
- P = MEASURED VALUE FOR PERFORMANCE STANDARD
- R = CAL INCREASED CONCENTRATION RESULTING FROM LAB SPIKE
- S = MEASURED CONCENTRATION OF LAB SPIKED SAMPLE
- T = TRUE VALUE OF PERFORMANCE STANDARD
- W = MEASURED CONCENTRATION OF LAB SPIKED DUPLICATE
- Y = MEASURED CONCENTRATION OF FIELD SPIKED SAMPLE
- Z = CAL INCREASED CONCENTRATION RESULTING FROM FIELD SPIKE
- 1 = MEASURED VALUE OF FIRST SPIKED REPLICATE
- 2 = MEASURED VALUE OF SECOND SPIKED REPLICATE
- 3 = MEASURED VALUE OF THIRD SPIKED REPLICATE
- 4 = MEASURED VALUE OF FOURTH SPIKED REPLICATE
- 5 = MEASURED VALUE OF FIFTH SPIKED REPLICATE
- 6 = MEASURED VALUE OF SIXTH SPIKED REPLICATE
- 7 = MEASURED VALUE OF SEVENTH SPIKED REPLICATE

= MEDIA CODE (A ONE-LETTER CODE DESIGNATING THE MEDIA OF THE SAMPLE):

- A = AIR
- H = HAZARDOUS WASTE/OTHER
- S = SOLID (SOIL, SEDIMENT, SLUDGE)
- T = TISSUE (PLANT & ANIMAL)
- W = WATER (GROUND WATER, SURFACE WATER, WASTE WATER, DRINKING WATER)

CRIPTION = A SHORT DESCRIPTION OF THE LOCATION WHERE SAMPLE WAS COLLECTED

S/STORET LOC. NO. = THE SPECIFIC LOCATION ID NUMBER OF EITHER OF THESE NATIONAL DATABASE SYSTEMS, AS APPROPRIATE

E/TIME INFORMATION = SPECIFIC INFORMATION REGARDING WHEN THE SAMPLE WAS COLLECTED

- BEG. DATE = DATE SAMPLING WAS STARTED
- BEG. TIME = TIME SAMPLING WAS STARTED
- END DATE = DATE SAMPLING WAS COMPLETED
- END TIME = TIME SAMPLING WAS COMPLETED
- NOTE: A GRAB SAMPLE WILL CONTAIN ONLY BEG. DATE/TIME
  A TIMED COMPOSITE SAMPLE WILL CONTAIN BOTH BEG AND END DATE/TIME TO DESIGNATE DURATION OF SAMPLE COLLECTION

ER CODES

- V = VALIDATED

ANALYTICAL RESULTS/MEASUREMENTS INFORMATION:

COMPOUND = MGP (MEDIA-GROUP-PARAMETER) CODE AND NAME OF THE MEASURED CONSTITUENT OR CHARACTERISTIC OF EACH SAMPLE

UNITS = SPECIFIC UNITS IN WHICH RESULTS ARE REPORTED:

- C = CENTIGRADE (CELSIUS) DEGREES
- CFS = CUBIC FEET PER SECOND
- GPM = GALLONS PER MINUTE
- IN = INCHES
- I.D. = SPECIES IDENTIFICATION
- KG = KILOGRAM
- L = LITER
- LB = POUNDS
- MG = MILLIGRAMS (1 X 10-3 GRAMS)
- MGD = MILLION GALLONS PER DAY
- MPH = MILES PER HOUR
- MV = MILLIVOLT
- M/F = MALE/FEMALE
- M2 = SQUARE METER
- M3 = CUBIC METER
- NA = NOT APPLICABLE
- NG = NANOGRAMS (1 X 10-9 GRAMS)
- NTU = NEPHELOMETRIC TURBIDITY UNITS
- PC/L = PICO (1 X 10-12) CURRIES PER LITER
- PG = PICOGRAMS (1 X 10-12 GRAMS)
- P/CM2 = PICOGRAMS PER SQUARE CENTIMETER
- SCM = STANDARD CUBIC METER (1 ATM, 25 C)
- SQ FT = SQUARE FEET
- SU = STANDARD UNITS (PH)
- UG = MICROGRAMS (1 X 10-6 GRAMS)
- UMHOS = MICROMHOS/CM (CONDUCTIVITY UNITS)
- U/CC2 = MICROGRAMS PER 100 SQUARE CENTIMETERS
- U/CM2 = MICROGRAMS PER SQUARE CENTIMETER
- 1000G = 1000 GALLONS
- +/- = POSITIVE/NEGATIVE
- # = NUMBER

DATA QUALIFIERS = SPECIFIC CODES USED IN CONJUNCTION WITH DATA VALUES TO PROVIDE ADDITIONAL INFORMATION ON THE REPORTED RESULTS, OR USED TO EXPLAIN THE ABSENCE OF A SPECIFIC VALUE:

- BLANK = IF FIELD IS BLANK, NO REMARKS OR QUALIFIERS ARE PERTINENT. FOR FINAL REPORTED DATA, THIS MEANS THAT THE VALUES HAVE BEEN REVIEWED AND FOUND TO BE ACCEPTABLE FOR USE.
- I = INVALID SAMPLE/DATA - VALUE NOT REPORTED
- J = DATA REPORTED BUT NOT VALID BY APPROVED QC PROCEDURES
- K = ACTUAL VALUE OF SAMPLE IS < VALUE REPORTED
- L = ACTUAL VALUE OF SAMPLE IS > VALUE REPORTED
- M = DETECTED BUT BELOW THE LEVEL OF REPORTED VALUE FOR ACCURATE QUANTIFICATION
- O = PARAMETER NOT ANALYZED
- U = ACTUAL VALUE OF SAMPLE IS < THE MEASUREMENT DETECTION LIMIT (REPORTED VALUE)

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 6-DC1CY VALIDATED DATA

	COMPOUND	UNITS	001		001 D		002		003 F		007 F	
7	PCB-AROCLOR 1016	UG/L	0.40	U	0.40	U	0.40	U	0.40	U		
8	PCB-AROCLOR 1221	UG/L	0.30	U	0.30	U	0.30	U	0.30	U		
9	PCB-AROCLOR 1232	UG/L	0.10	U	0.10	U	0.10	U	0.10	U		
0	PCB-AROCLOR 1242	UG/L	0.10	U	0.10	U	0.10	U	0.10	U		
1	PCB-AROCLOR 1248	UG/L	0.20	U	0.20	U	0.20	U	0.20	U		
2	PCB-AROCLOR 1254	UG/L	0.14	U	0.10	U	0.077	U	0.050	U		
3	PCB-AROCLOR 1260	UG/L	0.060	U	0.060	U	0.060	U	0.060	U		
1	PHENOL, BY GC/MS	UG/L	1.3	U	1.3	U	1.3	U	1.3	U		
3	ETHER,BIS(2-CHLOROETHYL), BY GC/MS	UG/L	3	U	3	U	3	U	3	U		
4	CHLOROPHENOL, 2-	UG/L	2.7	U	2.7	U	2.7	U	2.7	U		
5	DICHLOROBENZENE,1,3-, BY GC/MS	UG/L	2.2	U	2.2	U	2.2	U	2.2	U		
6	DICHLOROBENZENE,1,4-	UG/L	2.3	U	2.3	U	2.3	U	2.3	U		
7	BENZYL ALCOHOL	UG/L	1.3	U	1.3	U	1.3	U	1.3	U		
8	DICHLOROBENZENE,1,2-, BY GC/MS	UG/L	2.5	U	2.5	U	2.5	U	2.5	U		
9	CRESOL, ORTHO(2-METHYLPHENOL)	UG/L	2.3	U	2.3	U	2.3	U	2.3	U		
0	ETHER,BIS(2-CHLOROISOPROPYL), BY GC/MS	UG/L	1.4	U	1.4	U	1.4	U	1.4	U		
1	CRESOL, PARA-(4-METHYLPHENOL)	UG/L	3.3	U	3.3	U	3.3	U	3.3	U		
2	N-NITROSODIPROPYLAMINE	UG/L	1.5	U	1.5	U	1.5	U	1.5	U		
3	HEXACHLOROETHANE, BY GC/MS	UG/L	2.4	U	2.4	U	2.4	U	2.4	U		
4	NITROBENZENE, BY GC/MS	UG/L	1.5	U	1.5	U	1.5	U	1.5	U		
5	ISOPHORONE, BY GC/MS	UG/L	5	U	5	U	5	U	5	U		
5	NITROPHENOL,2-	UG/L	2.1	U	2.1	U	2.1	U	2.1	U		
7	DIMETHYLPHENOL,2,4, BY GC/MS	UG/L	2.1	U	2.1	U	2.1	U	2.1	U		
3	BENZOIC ACID, BY GC/MS	UG/L	20	U	20	U	20	U	20	U		
9	METHANE, BIS(2-CHLOROETHYOXY), BY GC/MS	UG/L	1.4	U	1.4	U	1.4	U	1.4	U		
0	DICHLOROPHENOL, 2,4-	UG/L	3.1	U	3.1	U	3.1	U	3.1	U		

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 6-DC1CY VALIDATED DATA

COMPOUND	UNITS	001	001 D	002	003 F	007 F
WS21 TRICHLOROBENZENE,1,2,4, BY GC/MS	UG/L	5 U	5 U	5 U	5 U	
WS22 NAPHTHALENE, BY GC/MS	UG/L	2 U	2 U	2 U	2 U	
WS23 CHLOROANILINE,4-	UG/L	5 U	5 U	5 U	5 U	
WS24 HEXACHLOROBUTADIENE, BY GC/MS	UG/L	1.9 U	1.9 U	1.9 U	1.9 U	
WS25 PHENOL,4-CHLORO-3-METHYL	UG/L	2.8 U	2.8 U	2.8 U	2.8 U	
WS26 METHYLNAPHTHALENE, 2-	UG/L	1.8 U	1.8 U	1.8 U	1.8 U	
WS27 HEXACHLOROCYCLOPENTADIENE, BY GC/MS	UG/L	10 U	10 U	10 U	10 U	
WS28 TRICHLOROPHENOL,2,4,6	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	
WS29 TRICHLOROPHENOL,2,4,5	UG/L	3 U	3 U	3 U	3 U	
WS30 CHLORONAPHTHALENE, 2-	UG/L	1.5 U	1.5 U	1.5 U	1.5 U	
WS31 NITROANILINE,2-(ORTHO)	UG/L	5 U	5 U	5 U	5 U	
WS32 PHTHALATE, DIMETHYL, BY GC/MS	UG/L	10 U	10 U	10 U	10 U	
WS33 ACENAPHTHYLENE, BY GC/MS	UG/L	1.3 U	1.3 U	1.3 U	1.3 U	
WS34 NITROANILINE,3-	UG/L	10 U	10 U	10 U	10 U	
WS35 ACENAPHTHENE, BY GC/MS	UG/L	1.1 U	1.1 U	86	1.1 U	
WS36 DINITROPHENOL,2,4, BY GC/MS	UG/L	20 U	20 U	20 U	20 U	
WS37 NITROPHENOL,4-	UG/L	14 U	14 U	14 U	14 U	
WS38 DIBENZOFURAN	UG/L	1.2 U	1.2 U	1.2 U	1.2 U	
WS39 DINITROTOLUENE,2,4, BY GC/MS	UG/L	10 U	10 U	10 U	10 U	
WS40 DINITROTOLUENE,2,6-	UG/L	5 U	5 U	5 U	5 U	
WS41 PHTHALATE, DIETHYL, BY GC/MS	UG/L	5 U	5 U	5 U	5 U	
WS42 ETHER, 4-CHLOROPHENYL PHENYL	UG/L	5 U	5 U	5 U	5 U	
WS43 FLUORENE, BY GC/MS	UG/L	5 U	5 U	29	5 U	
WS44 NITROANILINE,4-	UG/L	16 U	16 U	16 U	16 U	
WS45 PHENOL,4,6-DINITRO-2-METHYL	UG/L	10 U	10 U	10 U	10 U	
WS46 N-NITROSODIPHENYLAMINE, BY GC/MS	UG/L	1 U	1 U	1.0 U	1 U	

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 6-DC1CY VALIDATED DATA

	COMPOUND	UNITS	001		001 D		002		003 F		007 F	
47	ETHER, 4-BROMOPHENYL PHENYL	UG/L	5	U	5	U	5	U	5	U		
48	HEXACHLOROBENZENE, BY GC/MS	UG/L	5	U	5	U	5	U	5	U		
49	PENTACHLOROPHENOL, BY GC/MS	UG/L	20	U	20	U	20	U	20	U		
50	PHENANTHRENE, BY GC/MS	UG/L	1.1	U	1.1	U	26		1.1	U		
51	ANTHRACENE, BY GC/MS	UG/L	5	U	5	U	5	U	5	U		
52	PHTHALATE, DI-N-BUTYL-, BY GC/MS	UG/L	5	U	5	U	5	U	5	U		
53	FLUORANTHENE, BY GC/MS	UG/L	5	U	5	U	5	U	5	U		
54	PYRENE, BY GC/MS	UG/L	10	U	10	U	10	U	10	U		
55	PHTHALATE, BUTYL BENZYL	UG/L	10	U	10	U	10	U	10	U		
56	DICHLOROBENZIDINE, 3,3'	UG/L	25	U	25	U	25	U	25	U		
57	ANTHRACENE, BENZO(A), BY GC/MS	UG/L	10	U	10	U	10	U	10	U		
58	PHTHALATE, BIS(2-ETHYLHEXYL), BY GC/MS	UG/L	10	U	10	U	32		10	U		
59	CHRYSENE, BY GC/MS	UG/L	10	U	10	U	10	U	10	U		
60	PHTHALATE, DI-N-OCTYL-, BY GC/MS	UG/L	10	U	10	U	10	U	10	U		
61	FLUORANTHENE, BENZO(B), BY GC/MS	UG/L	10	U	10	U	10	U	10	U		
62	FLUORANTHENE, BENZO(K), BY GC/MS	UG/L	10	U	10	U	10	U	10	U		
63	PYRENE, BENZO(A), BY GC/MS	UG/L	10	U	10	U	10	U	10	U		
64	PYRENE, INDENO(1,2,3-CD)	UG/L	10	U	10	U	10	U	10	U		
65	ANTHRACENE, DIBENZO(A,H), BY GC/MS	UG/L	10	U	10	U	10	U	10	U		
66	PERYLENE,BENZO(G,H,I), BY GC/MS	UG/L	10	U	10	U	10	U	10	U		
67	CARBAZOLE	UG/L	10	U	10	U	10	U	10	U		
3	CHLOROMETHANE, BY GC/MS	UG/L	7	U	7	U	7	U	7	U	7	U
4	BROMOMETHANE, BY GC/MS	UG/L	4	U	4	U	4	U	4	U	4	U
5	VINYL CHLORIDE, BY GC/MS	UG/L	5	U	5	U	5	U	5	U	5	U
6	CHLOROETHANE, BY GC/MS	UG/L	4	U	4	U	4	U	4	U	4	U
7	METHYLENE CHLORIDE (DICHLOROMETHANE)	UG/L	4	U	4	U	4	U	4	U	28	

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 6-DC1CY VALIDATED DATA

COMPOUND	UNITS	001	001 D	002	003 F	007 F
8 DICHLOROETHYLENE,1,1-	UG/L	4 U	4 U	4 U	4 U	4 U
9 DICHLOROETHANE,1,1, BY GC/MS	UG/L	3 U	3 U	3 U	3 U	3 U
1 CHLOROFORM, BY GC/MS	UG/L	4 U	4 U	4 U	4 U	4 U
2 DICHLOROETHANE,1,2, BY GC/MS	UG/L	4 U	4 U	4 U	4 U	4 U
3 TRICHLOROETHANE,1,1,1-, BY GC/MS	UG/L	4 U	4 U	4 U	4 U	4 U
4 CARBON TETRACHLORIDE, BY GC/MS	UG/L	4 U	4 U	4 U	4 U	4 U
5 BROMODICHLOROMETHANE, BY GC/MS	UG/L	4 U	4 U	4 U	4 U	4 U
6 DICHLOROPROPANE,1,2, BY GC/MS	UG/L	4 U	4 U	4 U	4 U	4 U
7 BENZENE, BY GC/MS	UG/L	7 U	6 U	39	6 U	7 U
9 TRICHLOROETHYLENE	UG/L	4 U	4 U	4 U	4 U	4 U
0 DICHLOROPROPYLENE,CIS-1,3, BY GC/MS	UG/L	5 U	5 U	5 U	5 U	5 U
1 DIBROMOCHLOROMETHANE, BY GC/MS	UG/L	3 U	3 U	3 U	3 U	3 U
2 TRICHLOROETHANE,1,1,2-, BY GC/MS	UG/L	4 U	4 U	4 U	4 U	4 U
4 BROMOFORM, BY GC/MS	UG/L	3 U	3 U	3 U	3 U	3 U
5 TETRACHLOROETHYLENE	UG/L	4 U	4 U	4 U	4 U	4 U
6 TOLUENE, BY GC/MS	UG/L	4 U	4 U	4 U	4 U	4 U
7 TETRACHLOROETHANE,1,1,2,2, BY GC/MS	UG/L	4 U	4 U	4 U	4 U	4 U
8 CHLOROBENZENE, BY GC/MS	UG/L	4 U	4 U	4 U	4 U	4 U
9 ETHYL BENZENE, BY GC/MS	UG/L	4 U	4 U	4 U	4 U	4 U
0 ACETONE, BY GC/MS	UG/L	7	4 U	8	20	13
1 CARBON DISULFIDE, BY GC/MS	UG/L	3 U	3 U	3 U	3 U	3 U
2 METHYL ETHYL KETONE (2-BUTANONE)	UG/L	15 U	15 U	15 U	15 U	15 U
4 HEXANONE, 2-	UG/L	14 U	14 U	14 U	14 U	14 U
5 4-METHYL-2-PENTANONE(MIBK)	UG/L	3 U	3 U	3 U	3 U	3 U
6 STYRENE, BY GC/MS	UG/L	4 U	4 U	4 U	4 U	4 U
0 DICHLOROPROPYLENE,TRANS-1,3	UG/L	3 U	3 U	3 U	3 U	3 U

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 6-DC1CY VALIDATED DATA

	COMPOUND	UNITS	001	001 D	002	003 F	007 F
67	XYLENE, M AND/OR P	UG/L	8 U	8 U	4 U	8 U	8 U
70	XYLENE, ORTHO	UG/L	4 U	4 U	4 U	4 U	4 U
72	DICHLOROBENZENE,1,4-(PARA)	UG/L	5 U	5 U	5 U	5 U	5 U
74	DICHLOROBENZENE,1,3-(META)	UG/L	4 U	4 U	4 U	4 U	4 U
77	DICHLOROBENZENE,1,2-(ORTHO)	UG/L	4 U	4 U	4 U	4 U	4 U
78	DICHLOROETHYLENE,TRANS-1,2	UG/L	3 U	3 U	3 U	3 U	3 U
82	DICHLOROETHYLENE,CIS-1,2	UG/L	4 U	4 U	4 U	4 U	4 U
01	SAMPLE NUMBER	NA	001	001	002	003	007
02	ACTIVITY CODE	NA	DC1CY	DC1CY	DC1CY	DC1CY	DC1CY

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 6-DC1CY VALIDATED DATA

COMPOUND	UNITS	008	100		100 D		101		102	
SG07 SOLIDS, PERCENT	%		79.4		77.9		81.4		74.4	
SP17 PCB-AROCLOR 1016	UG/KG		80	U	80	U	80	U	80	U
SP18 PCB-AROCLOR 1221	UG/KG		60	U	60	U	60	U	60	U
SP19 PCB-AROCLOR 1232	UG/KG		20	U	20	U	20	U	20	U
SP20 PCB-AROCLOR 1242	UG/KG		20	U	20	U	20	U	20	U
SP21 PCB-AROCLOR 1248	UG/KG		40	U	40	U	40	U	40	U
SP22 PCB-AROCLOR 1254	UG/KG		10	U	10	U	10	U	10	U
SP23 PCB-AROCLOR 1260	UG/KG		10	U	10	U	10	U	10	U
SS01 PHENOL, BY GC/MS	UG/KG		530	U	540	U	520	U	560	U
SS02 CARBAZOLE	UG/KG		330	U	330	U	320	U	350	U
SS03 ETHER,BIS(2-CHLOROETHYL), BY GC/MS	UG/KG		150	U	150	U	150	U	160	U
SS04 CHLOROPHENOL, 2-	UG/KG		400	U	410	U	390	U	430	U
SS05 DICHLOROBENZENE,1,3-, BY GC/MS	UG/KG		100	U	100	U	98	U	110	U
SS06 DICHLOROBENZENE,1,4-	UG/KG		130	U	130	U	120	U	130	U
SS07 BENZYL ALCOHOL	UG/KG		250	U	260	U	250	U	270	U
SS08 DICHLOROBENZENE,1,2-, BY GC/MS	UG/KG		150	U	150	U	150	U	160	U
SS09 CRESOL, ORTHO(2-METHYLPHENOL)	UG/KG		680	U	690	U	660	U	730	U
SS10 ETHER,BIS(2-CHLOROISOPROPYL), BY GC/MS	UG/KG		130	U	130	U	120	U	130	U
SS11 CRESOL, PARA-(4-METHYLPHENOL)	UG/KG		680	U	690	U	660	U	730	U
SS12 N-NITROSODIPROPYLAMINE	UG/KG		300	U	310	U	300	U	320	U
SS13 HEXACHLOROETHANE, BY GC/MS	UG/KG		100	U	100	U	98	U	110	U
SS14 NITROBENZENE, BY GC/MS	UG/KG		130	U	130	U	120	U	130	U
SS15 ISOPHORONE, BY GC/MS	UG/KG		230	U	230	U	220	U	240	U
SS16 NITROPHENOL,2-	UG/KG		350	U	360	U	340	U	380	U
SS17 DIMETHYLPHENOL,2,4, BY GC/MS	UG/KG		330	U	330	U	320	U	350	U
SS18 BENZOIC ACID, BY GC/MS	UG/KG		1100	U	1100	U	1100	U	1200	U

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 6-DC1CY VALIDATED DATA

COMPOUND	UNITS	008	100		100 D		101		102	
19 METHANE, BIS(2-CHLOROETHYOXY), BY GC/MS	UG/KG		250	U	260	U	250	U	270	U
20 DICHLOROPHENOL, 2,4-	UG/KG		480	U	490	U	470	U	510	U
21 TRICHLOROBENZENE,1,2,4, BY GC/MS	UG/KG		76	U	77	U	74	U	81	U
22 NAPHTHALENE, BY GC/MS	UG/KG		130	U	130	U	120	U	150	
23 CHLOROANILINE,4-	UG/KG		1000	U	1000	U	980	U	1100	U
24 HEXACHLOROBUTADIENE, BY GC/MS	UG/KG		76	U	77	U	74	U	81	U
25 PHENOL,4-CHLORO-3-METHYL	UG/KG		480	U	490	U	470	U	510	U
26 METHYLNAPHTHALENE, 2-	UG/KG		150	U	150	U	150	U	160	U
27 HEXACHLOROCYCLOPENTADIENE, BY GC/MS	UG/KG		76	U	77	U	74	U	81	U
28 TRICHLOROPHENOL,2,4,6	UG/KG		430	U	440	U	420	U	460	U
29 TRICHLOROPHENOL,2,4,5	UG/KG		530	U	540	U	520	U	560	U
30 CHLORONAPHTHALENE, 2-	UG/KG		180	U	180	U	170	U	190	U
31 NITROANILINE,2-	UG/KG		230	U	230	U	220	U	240	U
32 PHTHALATE, DIMETHYL, BY GC/MS	UG/KG		200	U	210	U	200	U	220	U
33 ACENAPHTHYLENE, BY GC/MS	UG/KG		180	U	180	U	170	U	190	U
34 NITROANILINE,3-	UG/KG		680	U	690	U	660	U	730	U
35 ACENAPHTHENE, BY GC/MS	UG/KG		180	U	180	U	170	U	190	U
36 DINITROPHENOL,2,4, BY GC/MS	UG/KG		1500	U	1500	U	1500	U	1600	U
37 NITROPHENOL,4-	UG/KG		76	U	77	U	74	U	81	U
38 DIBENZOFURAN	UG/KG		230	U	230	U	220	U	240	U
39 DINITROTOLUENE,2,4, BY GC/MS	UG/KG		580	U	590	U	570	U	620	U
40 DINITROTOLUENE,2,6-	UG/KG		250	U	260	U	250	U	270	U
41 PHTHALATE, DIETHYL, BY GC/MS	UG/KG		430	U	440	U	420	U	460	U
42 ETHER, 4-CHLOROPHENYL PHENYL	UG/KG		230	U	230	U	220	U	240	U
43 FLUORENE, GC/MS	UG/KG		200	U	210	U	200	U	220	U
44 NITROANILINE,4-	UG/KG		1600	U	1700	U	1600	U	1700	U

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 6-DC1CY VALIDATED DATA

COMPOUND	UNITS	008	100		100 D		101		102	
PHENOL,4,6-DINITRO-2-METHYL	UG/KG		600	U	620	U	590	U	650	U
N-NITROSODIPHENYLAMINE, BY GC/MS	UG/KG		50	U	51	U	49	U	54	U
ETHER, 4-BROMOPHENYL PHENYL	UG/KG		230	U	230	U	220	U	240	U
HEXACHLOROBENZENE, BY GC/MS	UG/KG		200	U	210	U	200	U	220	U
PENTACHLOROPHENOL, BY GC/MS	UG/KG		530	U	540	U	520	U	560	U
PHENANTHRENE, BY GC/MS	UG/KG		200	U	210	U	200	U	220	U
ANTHRACENE, BY GC/MS	UG/KG		280	U	280	U	270	U	300	U
PHTHALATE, DI-N-BUTYL-, BY GC/MS	UG/KG		330	U	330	U	320	U	350	U
FLUORANTHENE, BY GC/MS	UG/KG		100	U	100	U	98	U	570	
PYRENE, BY GC/MS	UG/KG		300	U	310	U	300	U	520	
PHTHALATE, BUTYL BENZYL	UG/KG		280	U	280	U	270	U	300	U
DICHLOROBENZIDINE, 3,3'	UG/KG		5000	U	5100	U	4900	U	5400	U
ANTHRACENE, BENZO(A), BY GC/MS	UG/KG		380	U	390	U	370	U	400	U
PHTHALATE, BIS(2-ETHYLHEXYL), BY GC/MS	UG/KG		450	U	460	U	440	U	480	U
CHRYSENE, BY GC/MS	UG/KG		300	U	310	U	300	U	320	U
PHTHALATE, DI-N-OCTYL-, BY GC/MS	UG/KG		180	U	180	U	170	U	190	U
FLUORANTHENE, BENZO(B), BY GC/MS	UG/KG		180	U	180	U	170	U	190	U
FLUORANTHENE, BENZO(K), BY GC/MS	UG/KG		330	U	330	U	320	U	350	U
PYRENE, BENZO(A), BY GC/MS	UG/KG		380	U	390	U	370	U	400	U
PYRENE, INDENO(1,2,3-CD)	UG/KG		530	U	540	U	520	U	560	U
ANTHRACENE, DIBENZO(A,H), BY GC/MS	UG/KG		530	U	540	U	520	U	560	U
PERYLENE,BENZO(G,H,I), BY GC/MS	UG/KG		350	U	360	U	340	U	380	U
CHLOROMETHANE, BY GC/MS	UG/KG		16	U	21	U	12	U	20	U
BROMOMETHANE, BY GC/MS	UG/KG		32	U	42	U	24	U	39	U
VINYL CHLORIDE, BY GC/MS	UG/KG		24	U	31	U	18	U	29	U
CHLOROETHANE, BY GC/MS	UG/KG		24	U	31	U	18	U	29	U

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 6-DC1CY VALIDATED DATA

COMPOUND	UNITS	008	100		100 D		101		102	
V07 METHYLENE CHLORIDE (DICHLOROMETHANE)	UG/KG		17		21	U	12	U	20	U
V08 DICHLOROETHYLENE,1,1, BY GC/MS	UG/KG		8	U	10	U	6	U	10	U
V09 DICHLOROETHANE,1,1, BY GC/MS	UG/KG		8	U	10	U	6	U	10	U
V10 DICHLOROETHYLENE,TRANS-1,2	UG/KG		8	U	10	U	6	U	10	U
V11 CHLOROFORM, BY GC/MS	UG/KG		8	U	10	U	6	U	10	U
V12 DICHLOROETHANE,1,2, BY GC/MS	UG/KG		8	U	10	U	6	U	10	U
V13 TRICHLOROETHANE,1,1,1-, BY GC/MS	UG/KG		8	U	10	U	6	U	10	U
V14 CARBON TETRACHLORIDE, BY GC/MS	UG/KG		8	U	10	U	6	U	10	U
V15 BROMODICHLOROMETHANE, BY GC/MS	UG/KG		8	U	10	U	6	U	10	U
V16 DICHLOROPROPANE,1,2, BY GC/MS	UG/KG		8	U	10	U	6	U	10	U
V17 BENZENE, BY GC/MS	UG/KG		8	U	10	U	6	U	10	U
V18 DICHLOROPROPYLENE,TRANS-1,3	UG/KG		8	U	10	U	6	U	10	U
V19 TRICHLOROETHYLENE, BY GC/MS	UG/KG		8	U	10	U	6	U	10	U
V20 DICHLOROPROPYLENE,CIS-1,3, BY GC/MS	UG/KG		8	U	10	U	6	U	10	U
V21 DIBROMOCHLOROMETHANE, BY GC/MS	UG/KG		8	U	10	U	6	U	10	U
V22 TRICHLOROETHANE,1,1,2-, BY GC/MS	UG/KG		8	U	10	U	6	U	10	U
V24 BROMOFORM, BY GC/MS	UG/KG		8	U	10	U	6	U	10	U
V25 TETRACHLOROETHYLENE, BY GC/MS	UG/KG		8	U	10	U	6	U	10	U
V26 TOLUENE, BY GC/MS	UG/KG		8	U	10	U	6	U	10	U
V27 TETRACHLOROETHANE,1,1,2,2, BY GC/MS	UG/KG		8	U	10	U	6	U	10	U
V28 CHLOROBENZENE, BY GC/MS	UG/KG		8	U	10	U	6	U	10	U
V29 ETHYL BENZENE, BY GC/MS	UG/KG		8	U	10	U	6	U	10	U
V30 ACETONE, BY GC/MS	UG/KG		28		70	U	18		53	U
V31 CARBON DISULFIDE, BY GC/MS	UG/KG		8	U	10	U	6	U	22	
V32 METHYL ETHYL KETONE	UG/KG		16	U	21	U	12	U	20	U
V34 HEXANONE, 2-	UG/KG		16	U	21	U	12	U	20	U

COMPOUND	UNITS	008	100	100 D	101	102
35 4-METHYL-2-PENTANONE(MIBK)	UG/KG		16 U	21 U	12 U	20 U
36 STYRENE, BY GC/MS	UG/KG		8 U	10 U	6 U	10 U
44 DICHLOROBENZENE,1,4-	UG/KG		8 U	10 U	6 U	10 U
49 XYLENE, ORTHO	UG/KG		8 U	10 U	6 U	10 U
57 XYLENE, M AND/OR P	UG/KG		16 U	21 U	6 U	20 U
60 DICHLOROBENZENE, 1, 3-	UG/KG		8 U	10 U	6 U	10 U
61 DICHLOROBENZENE, 1, 2-	UG/KG		8 U	10 U	6 U	10 U
63 DICHLOROETHYLENE, CIS -1,2	UG/KG		8 U	10 U	6 U	10 U
17 PCB-AROCLOR 1016	UG/L	0.40 U				
18 PCB-AROCLOR 1221	UG/L	0.30 U				
19 PCB-AROCLOR 1232	UG/L	0.10 U				
20 PCB-AROCLOR 1242	UG/L	0.10 U				
21 PCB-AROCLOR 1248	UG/L	0.20 U				
22 PCB-AROCLOR 1254	UG/L	0.050 U				
23 PCB-AROCLOR 1260	UG/L	0.060 U				
01 PHENOL, BY GC/MS	UG/L	1.3 U				
03 ETHER,BIS(2-CHLOROETHYL), BY GC/MS	UG/L	3 U				
04 CHLOROPHENOL, 2-	UG/L	2.7 U				
05 DICHLOROBENZENE,1,3-, BY GC/MS	UG/L	2.2 U				
06 DICHLOROBENZENE,1,4-	UG/L	2.3 U				
07 BENZYL ALCOHOL	UG/L	1.3 U				
08 DICHLOROBENZENE,1,2-, BY GC/MS	UG/L	2.5 U				
09 CRESOL, ORTHO(2-METHYLPHENOL)	UG/L	2.3 U				
10 ETHER,BIS(2-CHLOROISOPROPYL), BY GC/MS	UG/L	1.4 U				
11 CRESOL, PARA-(4-METHYLPHENOL)	UG/L	3.3 U				
12 N-NITROSODIPROPYLAMINE	UG/L	1.5 U				

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 6-DC1CY VALIDATED DATA

COMPOUND	UNITS	008		100	100 D	101	102
S13 HEXACHLOROETHANE, BY GC/MS	UG/L	2.4	U				
S14 NITROBENZENE, BY GC/MS	UG/L	1.5	U				
S15 ISOPHORONE, BY GC/MS	UG/L	5	U				
S16 NITROPHENOL,2-	UG/L	2.1	U				
S17 DIMETHYLPHENOL,2,4, BY GC/MS	UG/L	2.1	U				
S18 BENZOIC ACID, BY GC/MS	UG/L	20	U				
S19 METHANE, BIS(2-CHLOROETHYOXY), BY GC/MS	UG/L	1.4	U				
S20 DICHLOROPHENOL, 2,4-	UG/L	3.1	U				
S21 TRICHLOROBENZENE,1,2,4, BY GC/MS	UG/L	5	U				
S22 NAPHTHALENE, BY GC/MS	UG/L	2	U				
S23 CHLOROANILINE,4-	UG/L	5	U				
S24 HEXACHLOROBUTADIENE, BY GC/MS	UG/L	1.9	U				
S25 PHENOL,4-CHLORO-3-METHYL	UG/L	2.8	U				
S26 METHYLNAPHTHALENE, 2-	UG/L	1.8	U				
S27 HEXACHLOROCYCLOPENTADIENE, BY GC/MS	UG/L	10	U				
S28 TRICHLOROPHENOL,2,4,6	UG/L	2.5	U				
S29 TRICHLOROPHENOL,2,4,5	UG/L	3	U				
S30 CHLORONAPHTHALENE, 2-	UG/L	1.5	U				
S31 NITROANILINE,2-(ORTHO)	UG/L	5	U				
S32 PHTHALATE, DIMETHYL, BY GC/MS	UG/L	10	U				
S33 ACENAPHTHYLENE, BY GC/MS	UG/L	1.3	U				
S34 NITROANILINE,3-	UG/L	10	U				
S35 ACENAPHTHENE, BY GC/MS	UG/L	1.1	U				
S36 DINITROPHENOL,2,4, BY GC/MS	UG/L	20	U				
S37 NITROPHENOL,4-	UG/L	14	U				
S38 DIBENZOFURAN	UG/L	1.2	U				

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 6-DC1CY VALIDATED DATA

COMPOUND	UNITS	008		100	100 D	101	102
9 DINITROTOLUENE,2,4, BY GC/MS	UG/L	10	U				
0 DINITROTOLUENE,2,6-	UG/L	5	U				
1 PHTHALATE, DIETHYL, BY GC/MS	UG/L	5	U				
2 ETHER, 4-CHLOROPHENYL PHENYL	UG/L	5	U				
3 FLUORENE, BY GC/MS	UG/L	5	U				
4 NITROANILINE,4-	UG/L	16	U				
5 PHENOL,4,6-DINITRO-2-METHYL	UG/L	10	U				
6 N-NITROSODIPHENYLAMINE, BY GC/MS	UG/L	1	U				
7 ETHER, 4-BROMOPHENYL PHENYL	UG/L	5	U				
8 HEXACHLOROBENZENE, BY GC/MS	UG/L	5	U				
9 PENTACHLOROPHENOL, BY GC/MS	UG/L	20	U				
0 PHENANTHRENE, BY GC/MS	UG/L	1.1	U				
1 ANTHRACENE, BY GC/MS	UG/L	5	U				
2 PHTHALATE, DI-N-BUTYL-, BY GC/MS	UG/L	5	U				
3 FLUORANTHENE, BY GC/MS	UG/L	5	U				
4 PYRENE, BY GC/MS	UG/L	10	U				
5 PHTHALATE, BUTYL BENZYL	UG/L	10	U				
6 DICHLOROBENZIDINE, 3,3'	UG/L	25	U				
7 ANTHRACENE, BENZO(A), BY GC/MS	UG/L	10	U				
8 PHTHALATE, BIS(2-ETHYLHEXYL), BY GC/MS	UG/L	10	U				
9 CHRYSENE, BY GC/MS	UG/L	10	U				
0 PHTHALATE, DI-N-OCTYL-, BY GC/MS	UG/L	10	U				
1 FLUORANTHENE, BENZO(B), BY GC/MS	UG/L	10	U				
2 FLUORANTHENE, BENZO(K), BY GC/MS	UG/L	10	U				
3 PYRENE, BENZO(A), BY GC/MS	UG/L	10	U				
4 PYRENE, INDENO(1,2,3-CD)	UG/L	10	U				

COMPOUND	UNITS	008		100	100 D	101	102
WS65 ANTHRACENE, DIBENZO(A,H), BY GC/MS	UG/L	10	U				
WS66 PERYLENE,BENZO(G,H,I), BY GC/MS	UG/L	10	U				
WS67 CARBAZOLE	UG/L	10	U				
WV03 CHLOROMETHANE, BY GC/MS	UG/L	7	U				
WV04 BROMOMETHANE, BY GC/MS	UG/L	4	U				
WV05 VINYL CHLORIDE, BY GC/MS	UG/L	5	U				
WV06 CHLOROETHANE, BY GC/MS	UG/L	4	U				
WV07 METHYLENE CHLORIDE (DICHLOROMETHANE)	UG/L	4	U				
WV08 DICHLOROETHYLENE,1,1-	UG/L	4	U				
WV09 DICHLOROETHANE,1,1, BY GC/MS	UG/L	3	U				
WV11 CHLOROFORM, BY GC/MS	UG/L	4	U				
WV12 DICHLOROETHANE,1,2, BY GC/MS	UG/L	4	U				
WV13 TRICHLOROETHANE,1,1,1-, BY GC/MS	UG/L	4	U				
WV14 CARBON TETRACHLORIDE, BY GC/MS	UG/L	4	U				
WV15 BROMODICHLOROMETHANE, BY GC/MS	UG/L	4	U				
WV16 DICHLOROPROPANE,1,2, BY GC/MS	UG/L	4	U				
WV17 BENZENE, BY GC/MS	UG/L	6	U				
WV19 TRICHLOROETHYLENE	UG/L	4	U				
WV20 DICHLOROPROPYLENE,CIS-1,3, BY GC/MS	UG/L	5	U				
WV21 DIBROMOCHLOROMETHANE, BY GC/MS	UG/L	3	U				
WV22 TRICHLOROETHANE,1,1,2-, BY GC/MS	UG/L	4	U				
WV24 BROMOFORM, BY GC/MS	UG/L	3	U				
WV25 TETRACHLOROETHYLENE	UG/L	4	U				
WV26 TOLUENE, BY GC/MS	UG/L	4	U				
WV27 TETRACHLOROETHANE,1,1,2,2, BY GC/MS	UG/L	4	U				
WV28 CHLOROBENZENE, BY GC/MS	UG/L	4	U				

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 6-DC1CY VALIDATED DATA

COMPOUND	UNITS	008		100	100 D	101	102
29 ETHYL BENZENE, BY GC/MS	UG/L	4	U				
50 ACETONE, BY GC/MS	UG/L	15					
31 CARBON DISULFIDE, BY GC/MS	UG/L	3	U				
32 METHYL ETHYL KETONE (2-BUTANONE)	UG/L	15	U				
34 HEXANONE, 2-	UG/L	14	U				
35 4-METHYL-2-PENTANONE(MIBK)	UG/L	3	U				
36 STYRENE, BY GC/MS	UG/L	4	U				
40 DICHLOROPROPYLENE,TRANS-1,3	UG/L	3	U				
57 XYLENE, M AND/OR P	UG/L	8	U				
70 XYLENE, ORTHO	UG/L	4	U				
72 DICHLOROBENZENE,1,4-(PARA)	UG/L	5	U				
74 DICHLOROBENZENE,1,3-(META)	UG/L	4	U				
77 DICHLOROBENZENE,1,2-(ORTHO)	UG/L	4	U				
78 DICHLOROETHYLENE,TRANS-1,2	UG/L	3	U				
82 DICHLOROETHYLENE,CIS-1,2	UG/L	4	U				
01 SAMPLE NUMBER	NA	008		100	100	101	102
02 ACTIVITY CODE	NA	DC1CY		DC1CY	DC1CY	DC1CY	DC1CY

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 6-DC1CY VALIDATED DATA

COMPOUND	UNITS	103		104		108 F		
G07 SOLIDS, PERCENT	%	74.7		77.1		99.3		
P17 PCB-AROCLOR 1016	UG/KG	80	U	80	U			
P18 PCB-AROCLOR 1221	UG/KG	60	U	60	U			
P19 PCB-AROCLOR 1232	UG/KG	20	U	20	U			
P20 PCB-AROCLOR 1242	UG/KG	20	U	20	U			
P21 PCB-AROCLOR 1248	UG/KG	40	U	40	U			
P22 PCB-AROCLOR 1254	UG/KG	10	U	10	U			
P23 PCB-AROCLOR 1260	UG/KG	10	U	10	U			
S01 PHENOL, BY GC/MS	UG/KG	560	U	540	U			
S02 CARBAZOLE	UG/KG	350	U	340	U			
S03 ETHER,BIS(2-CHLOROETHYL), BY GC/MS	UG/KG	160	U	160	U			
S04 CHLOROPHENOL, 2-	UG/KG	430	U	410	U			
S05 DICHLOROBENZENE,1,3-, BY GC/MS	UG/KG	110	U	100	U			
S06 DICHLOROBENZENE,1,4-	UG/KG	130	U	130	U			
S07 BENZYL ALCOHOL	UG/KG	270	U	260	U			
S08 DICHLOROBENZENE,1,2-, BY GC/MS	UG/KG	160	U	160	U			
S09 CRESOL, ORTHO(2-METHYLPHENOL)	UG/KG	720	U	700	U			
S10 ETHER,BIS(2-CHLOROISOPROPYL), BY GC/MS	UG/KG	130	U	130	U			
S11 CRESOL, PARA-(4-METHYLPHENOL)	UG/KG	720	U	700	U			
S12 N-NITROSODIPROPYLAMINE	UG/KG	320	U	310	U			
S13 HEXACHLOROETHANE, BY GC/MS	UG/KG	110	U	100	U			
S14 NITROBENZENE, BY GC/MS	UG/KG	130	U	130	U			
S15 ISOPHORONE, BY GC/MS	UG/KG	240	U	230	U			
S16 NITROPHENOL,2-	UG/KG	380	U	360	U			
S17 DIMETHYLPHENOL,2,4, BY GC/MS	UG/KG	350	U	340	U			
S18 BENZOIC ACID, BY GC/MS	UG/KG	1200	U	1100	U			

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 6-DC1CY VALIDATED DATA

COMPOUND	UNITS	103		104		108 F		
19 METHANE, BIS(2-CHLOROETHYOXY), BY GC/MS	UG/KG	270	U	260	U			
20 DICHLOROPHENOL, 2,4-	UG/KG	510	U	490	U			
21 TRICHLOROBENZENE,1,2,4, BY GC/MS	UG/KG	80	U	78	U			
22 NAPHTHALENE, BY GC/MS	UG/KG	130	U	130	U			
23 CHLOROANILINE,4-	UG/KG	1100	U	1000	U			
24 HEXACHLOROBUTADIENE, BY GC/MS	UG/KG	80	U	78	U			
25 PHENOL,4-CHLORO-3-METHYL	UG/KG	510	U	490	U			
26 METHYLNAPHTHALENE, 2-	UG/KG	160	U	160	U			
27 HEXACHLOROCYCLOPENTADIENE, BY GC/MS	UG/KG	80	U	78	U			
28 TRICHLOROPHENOL,2,4,6	UG/KG	460	U	440	U			
29 TRICHLOROPHENOL,2,4,5	UG/KG	560	U	540	U			
30 CHLORONAPHTHALENE, 2-	UG/KG	190	U	180	U			
31 NITROANILINE,2-	UG/KG	240	U	230	U			
32 PHTHALATE, DIMETHYL, BY GC/MS	UG/KG	210	U	210	U			
33 ACENAPHTHYLENE, BY GC/MS	UG/KG	190	U	180	U			
34 NITROANILINE,3-	UG/KG	720	U	700	U			
35 ACENAPHTHENE, BY GC/MS	UG/KG	190	U	180	U			
36 DINITROPHENOL,2,4, BY GC/MS	UG/KG	1600	U	1600	U			
37 NITROPHENOL,4-	UG/KG	80	U	78	U			
38 DIBENZOFURAN	UG/KG	240	U	230	U			
39 DINITROTOLUENE,2,4, BY GC/MS	UG/KG	620	U	600	U			
40 DINITROTOLUENE,2,6-	UG/KG	270	U	260	U			
41 PHTHALATE, DIETHYL, BY GC/MS	UG/KG	460	U	440	U			
42 ETHER, 4-CHLOROPHENYL PHENYL	UG/KG	240	U	230	U			
43 FLUORENE, GC/MS	UG/KG	210	U	210	U			
44 NITROANILINE,4-	UG/KG	1700	U	1700	U			

COMPOUND	UNITS	103		104		108 F			
S45 PHENOL,4,6-DINITRO-2-METHYL	UG/KG	640	U	620	U				
S46 N-NITROSODIPHENYLAMINE, BY GC/MS	UG/KG	54	U	52	U				
S47 ETHER, 4-BROMOPHENYL PHENYL	UG/KG	240	U	230	U				
S48 HEXACHLOROBENZENE, BY GC/MS	UG/KG	210	U	210	U				
S49 PENTACHLOROPHENOL, BY GC/MS	UG/KG	560	U	540	U				
S50 PHENANTHRENE, BY GC/MS	UG/KG	210	U	210	U				
S51 ANTHRACENE, BY GC/MS	UG/KG	290	U	280	U				
S52 PHTHALATE, DI-N-BUTYL-, BY GC/MS	UG/KG	350	U	340	U				
S53 FLUORANTHENE, BY GC/MS	UG/KG	110	U	100	U				
S54 PYRENE, BY GC/MS	UG/KG	320	U	310	U				
S55 PHTHALATE, BUTYL BENZYL	UG/KG	290	U	280	U				
S56 DICHLOROBENZIDINE, 3,3'	UG/KG	5400	U	5200	U				
S57 ANTHRACENE, BENZO(A), BY GC/MS	UG/KG	400	U	390	U				
S58 PHTHALATE, BIS(2-ETHYLHEXYL), BY GC/MS	UG/KG	480	U	470	U				
S59 CHRYSENE, BY GC/MS	UG/KG	320	U	310	U				
S60 PHTHALATE, DI-N-OCTYL-, BY GC/MS	UG/KG	190	U	180	U				
S61 FLUORANTHENE, BENZO(B), BY GC/MS	UG/KG	190	U	180	U				
S62 FLUORANTHENE, BENZO(K), BY GC/MS	UG/KG	350	U	340	U				
S63 PYRENE, BENZO(A), BY GC/MS	UG/KG	400	U	390	U				
S64 PYRENE, INDENO(1,2,3-CD)	UG/KG	560	U	540	U				
S65 ANTHRACENE, DIBENZO(A,H), BY GC/MS	UG/KG	560	U	540	U				
S66 PERYLENE,BENZO(G,H,I), BY GC/MS	UG/KG	380	U	360	U				
V03 CHLOROMETHANE, BY GC/MS	UG/KG	12	U	12	U	10	U		
V04 BROMOMETHANE, BY GC/MS	UG/KG	24	U	24	U	20	U		
V05 VINYL CHLORIDE, BY GC/MS	UG/KG	18	U	18	U	15	U		
V06 CHLOROETHANE, BY GC/MS	UG/KG	18	U	18	U	15	U		

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 6-DC1CY VALIDATED DATA

COMPOUND	UNITS	103		104		108 F			
V07 METHYLENE CHLORIDE (DICHLOROMETHANE)	UG/KG	12	U	12	U	10	U		
V08 DICHLOROETHYLENE,1,1, BY GC/MS	UG/KG	6	U	6	U	5	U		
V09 DICHLOROETHANE,1,1, BY GC/MS	UG/KG	6	U	6	U	5	U		
V10 DICHLOROETHYLENE,TRANS-1,2	UG/KG	6	U	6	U	5	U		
V11 CHLOROFORM, BY GC/MS	UG/KG	6	U	6	U	5	U		
V12 DICHLOROETHANE,1,2, BY GC/MS	UG/KG	6	U	6	U	5	U		
V13 TRICHLOROETHANE,1,1,1-, BY GC/MS	UG/KG	6	U	6	U	5	U		
V14 CARBON TETRACHLORIDE, BY GC/MS	UG/KG	6	U	6	U	5	U		
V15 BROMODICHLOROMETHANE, BY GC/MS	UG/KG	6	U	6	U	5	U		
V16 DICHLOROPROPANE,1,2, BY GC/MS	UG/KG	6	U	6	U	5	U		
V17 BENZENE, BY GC/MS	UG/KG	6	U	6	U	5	U		
V18 DICHLOROPROPYLENE,TRANS-1,3	UG/KG	6	U	6	U	5	U		
V19 TRICHLOROETHYLENE, BY GC/MS	UG/KG	6	U	6	U	5	U		
V20 DICHLOROPROPYLENE,CIS-1,3, BY GC/MS	UG/KG	6	U	6	U	5	U		
V21 DIBROMOCHLOROMETHANE, BY GC/MS	UG/KG	6	U	6	U	5	U		
V22 TRICHLOROETHANE,1,1,2-, BY GC/MS	UG/KG	6	U	6	U	5	U		
V24 BROMOFORM, BY GC/MS	UG/KG	6	U	6	U	5	U		
V25 TETRACHLOROETHYLENE, BY GC/MS	UG/KG	6	U	6	U	5	U		
V26 TOLUENE, BY GC/MS	UG/KG	6	U	6	U	5	U		
V27 TETRACHLOROETHANE,1,1,2,2, BY GC/MS	UG/KG	6	U	6	U	5	U		
V28 CHLOROBENZENE, BY GC/MS	UG/KG	6	U	6	U	5	U		
V29 ETHYL BENZENE, BY GC/MS	UG/KG	6	U	6	U	5	U		
V30 ACETONE, BY GC/MS	UG/KG	18		17		580			
V31 CARBON DISULFIDE, BY GC/MS	UG/KG	6	U	6	U	5	U		
V32 METHYL ETHYL KETONE	UG/KG	12	U	12	U	28			
V34 HEXANONE, 2-	UG/KG	12	U	12	U	10	U		

ANALYSIS REQUEST DETAIL REPORT ACTIVITY: 6-DC1CY VALIDATED DATA

COMPOUND	UNITS	103		104		108	F		
V35 4-METHYL-2-PENTANONE(MIBK)	UG/KG	12	U	12	U	10			
V36 STYRENE, BY GC/MS	UG/KG	6	U	6	U	5	U		
V44 DICHLOROBENZENE,1,4-	UG/KG	6	U	6	U	26			
V49 XYLENE, ORTHO	UG/KG	6	U	6	U	5	U		
V57 XYLENE, M AND/OR P	UG/KG	12	U	12	U	5	U		
V60 DICHLOROBENZENE, 1, 3-	UG/KG	6	U	6	U	27			
V61 DICHLOROBENZENE, 1, 2-	UG/KG	6	U	6	U	11			
V63 DICHLOROETHYLENE, CIS -1,2	UG/KG	6	U	6	U	5	U		
Z01 SAMPLE NUMBER	NA	103		104		108			
Z02 ACTIVITY CODE	NA	DC1CY		DC1CY		DC1CY			

ACTIVITY DC1CY MOUND STREET PCBS

IE PROJECT LEADER SHOULD CIRCLE ONE - STORET, AIRS, OR ARCHIVE.

CIRCLE ONE: STORET AIRS ARCHIVE

DATA APPROVED BY LABO FOR TRANSMISSION TO PROJECT LEADER ON 05/03/96 13:32:27 BY

APPENDIX D

CITED REFERENCES

DEPARTMENT OF NATURAL RESOURCES
Division of Environmental Quality
Hazardous Waste Program

Reference 1

TELEPHONE OR CONFERENCE RECORD

File: Mound Street PCBs

Date: March 15, 1994

TELEPHONE (314) 425-4468

CONFERENCE

Incoming ( )
Outgoing (X)

Field ( )
Office ( )

SUBJECT: Jefferson National Expansion Memorial - Gateway Arch

PERSONS INVOLVED

Name	Representing
Ms. Louise Barra	National Park Service, Gateway Arch
Don Falls	MDNR, Hazardous Waste Program

SUMMARY OF CONVERSATION:

I phoned the public affairs office of the Jefferson National Expansion Memorial in St. Louis and spoke with a Ms. Louise Barra. Ms. Barra is a public affairs officer with the National Park Service. I asked Ms. Barra if she could tell me the exact acreage of the park and the total annual attendance. Ms. Barra informed me that the park encompasses just over 90 acres and the total annual attendance for all the park property, including the parking structure, is approximately 2.7 million people.

FINAL RESULTS:

This information will be incorporated into the Mound Street PCB Preliminary Assessment.

Don Falls

Don Falls
Environmental Specialist
Hazardous Waste Program

DF:so

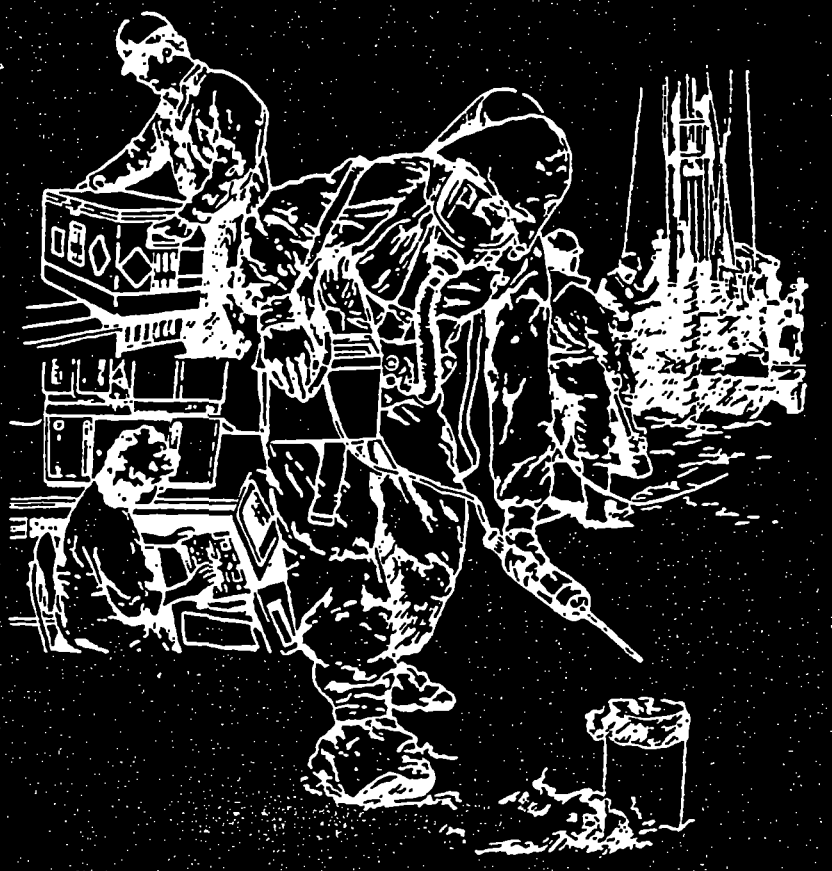
Reference 3

Final Report
Screening Site Inspection
Laclede Coal Gas
St. Louis, Missouri
EPA ID# MOD981715980
TDD #F-07-9008-020 PAN #FM00579SA
Site #Y33 Project #002
Prepared by E & E/FIT for the
Region VII EPA RPO
Project Manager: Keith Brown
Superfund Contact: Greg Reesor
Date: October 29, 1991

EPA

HAZARDOUS SITE EVALUATION DIVISION

Field Investigation Team Zone II



CONTRACT NO.
68-01-7347

ecology and environment, inc.

Reference 4

Preliminary Assessment
Mound Street Power Plant
St. Louis, Missouri
TDD #F-07-8708-29 PAN #FM00579PA
Site #Y33 Project #001
Prepared by: E & E/FIT for Region VII EPA
Task Leader: Eric Hess, E & E/FIT
Superfund Contact: Pauletta R. France-Isetts
Date: June 23, 1988

Reference 5

DEPARTMENT OF NATURAL RESOURCES
Division of Environmental Quality
Hazardous Waste Program

TELEPHONE OR CONFERENCE RECORD

File: Mound Street PCB Site

Date: December 13, 1993

TELEPHONE (314) 436-8735

CONFERENCE

Incoming ( )
Outgoing (X)

Field ( )
Office (X)

SUBJECT: Mound Street PCB Site

PERSONS INVOLVED

Name	Representing
Don Falls	MDNR/HWP
Howard Edmond	Metropolitan Sewer District
Anne Olberding	USEPA, Region VII (913) 551-7718
Bob Jackson	USEPA, Region VII (913) 551-7020

SUMMARY OF CONVERSATION:

I phoned Mr. Howard Edmond of the MSD (Metropolitan Sewer District) to find out exactly how the waste oil was seeping into the Brooklyn Street pump station. Mr. Howard explained that sometime around the middle of July 1993, oil was noticed seeping from the storm sewer into the wet well of the pump station. Mr. Howard said that the Brooklyn Street pump station only pumps storm water, and therefore only operates during periods of rain. Mr. Howard said that the oil stayed on top of the wet well, and was later pumped off by React Environmental. He said that it was possible that some of the oil made it out to the river. Mr. Howard said that the MSD laboratory did the analysis on the samples that he collected. The results indicate Aroclor 1254 in the oil at 47 parts per million.

I then asked Mr. Howard if he was familiar with the history of the Mound Street site. He related that there was a rumor that the basement of the former Union Electric building, which occupied part of the site, was said to be full of old transformers, and was claimed to be an EPA (U.S. Environmental Protection Agency) Superfund site where a "poor cleanup" was performed before the building was demolished.

Mr. Howard further said that he believes that the City of St Louis may now own the former Union Electric property, and Inspector Charles Gay with the St. Louis Fire Department would know more about the site, because he has been working on the site for some time.

ACTION TAKEN:

I phoned the St. Louis City Fire Department (314/298-1900) and asked to speak with Mr. Charles Gay. The secretary there said that Mr. Gay was out of the office, but would leave a message for him to call me. I then called Ms. Anne Olberding, EPA Region VII, and asked if she was aware of an EPA cleanup in the vicinity of the Mound and First Streets in St. Louis. Ms. Olberding said that location did not ring a bell, but she would search Cerclis according to site latitude and then send me the results.

In addition, I also spoke with Mr. Bob Krager, MDNR, Hazardous Waste Program, and asked if he was aware of any Superfund activities at the former Union Electric property at Mound Street. Mr. Krager said that he was unaware of any activities at that particular location and suggested that I contact Mr. Bob Jackson at EPA Region VII. I phoned Mr. Jackson who said that he would check the TOSCA records. Mr. Jackson called back and informed me that he could find nothing in the records about an EPA cleanup at the Union Electric power plant near Mound Street.

FINAL RESULTS:

This information will be used in the Mound Street PCB preliminary assessment.

Don Falls

Don Falls
Environmental Specialist

DF:so

Sverdrup **TELECON MEMO** Reference 6

Memo No. 1 Job No. 10865-376303

Date Nov 21 19 95 Time 9:00 AM - 9:25

Between (Sv C) Mike Mau Placed ✓ Rec'd

And Howard Edmond Tel (314) 436-8735

Of St. Louis Metropolitan Sewer District (MSD)

Subject Mound Street PCBs / USTs / Manhole Sampling

① - old granary building south end - found an old UST, got in manhole & floodwalls TRRA

- never could really determine exact source

- Removal was turned over to city of St. Louis & Railroad - was on railroad property

- Chief Horne - Fire Inspector

(may have city Block & Lot #s) 289-1900

(worked with fire marshall - Railroad ↳ N&W or Ill. Central

- little street between granary & pump station ↳ operates only during rain

- floodwall manholes - not sewers but underground drainage keeps

- no seepage of oil from 1993 that he knows of - no complaints

DNR & EPA taken care back then

- [samples on identifying source / 768-6200 permit dept. MSD

City - permit office Hampton Ave

- City Block & Lot #]

F-GAI (12) (13) (14)

floodwall → manhole Nothing to do with MSD

- Corp of Engineers need to check

Original:

cc:

Sverdrup **TELECON MEMO**

Memo No. 1 Job No. 10865-370303

Date Nov. 21 19 95 Time 9:00 m

Between (S v C) Mike May Placed ✓ Rec'd ____

And Howard Edmond Tel (314) 436-8735

Of St. Louis M.S.D.

Subject Mound Street PCBs / USTs & other sources / pump septic

City Block & Block #

? Old # 622-3313 - House Numbering
↳ (Address)
Then they can get you block #

- Pumps to Bissell pt. Treatment
  - 10 E Grand
  - 3 or 4 miles
  - But
  - goes to interceptor sewer first then to treatment plant ("any bodies guess as to how it really works!")

Boundary
- Dakota to N. North comes to Bissell Point Plant
- goes west to Kings Highway
- Out airport

- Record of sampling under FOI
  FOI - need to write letter

Howard Edmond's boss ← Bernard Rains
Director of Environmental Compliance of MSD
No. 10 E Grand
St. Louis, MO 63147

Original:
cc:

Sverdrup **TELECON MEMO**

Memo No. 1 Job No. 10865-370303

Date Nov-21 19 95 Time 9:00 m

Between (S v C) Mike May Placed ____ Rec'd ____

And Howard Edmond Tel (314) 436-8735

Of St. Louis M.S.D.

Subject Mound Street PCBs / UST's & other sources / pump system

Summary

- reiterated that the manholes were not "storm drainage" related. The pump station only pumps under circumstances of exceedingly heavy precipitation or if the River level is at or exceeding flood stage. Manholes are for protection of the flood wall (underground H,O) not storm sewer.
- If there would have been oil recognized since 1993 then Howard's crews would have definitely reported the oil in the manholes or pumping station
- call Chief Horne first, before calling city for lot & block #'s - May have this information already.

Original:
cc:

FILE: Mound Street PCB's

Reference 7

STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MEMORANDUM

DATE: November 22, 1993

TO: Mound Street PCB Site

FROM: Don Falls, Environmental Specialist
Site Evaluation Unit, Superfund Section
Hazardous Waste Program

SUBJECT: Mound Street PCB Site Reconnaissance

On November 11, 1993, I traveled to the Mound Street PCB site to conduct a site reconnaissance and meet with Mr. Daryl Bowles and Mr. David Gehm of the GEHM Corporation. The site is located at Mound and Brooklyn Streets, on the Riverfront, in downtown St Louis. I arrived at the site at 8:35 a.m. and first made a vehicle reconnaissance of the area within 1/4 mile of the site. The weather was clear and sunny with a temperature of approximately 55 degrees.

At 9:00 a.m., I met with Mr. Bowles and Mr. Gehm at the old terminal building. They were at the site to oversee the removal of waste oil that had been temporarily stored on-site from an earlier underground storage tank removal. I first asked Mr. Bowles if he could show me where the Metropolitan Sewer District pump station was located. He directed me to the pump station located at the end of Brooklyn Street, approximately 400 feet from the old terminal building. The pump station is located next to the flood wall and is surrounded by a security fence. I noted that five 55-gallon drums marked as waste oil and PCBs (Polychlorinated Biphenyl) were stored against the pump station south wall.

I then asked Mr. Bowles if he would show me exactly where the boring attempts were made that he had referred to in his activities report. We walked across Mound Street to an area immediately east of the old terminal building. This area appeared as an anomaly on the IR/T (Infrared Thermograph) survey completed in August 1993 by Entech Engineering as part of GEHM Inc.'s investigation of the site. Mr. Bowles explained that the drilling attempts were unsuccessful due to solid rock, cinder block, and other debris being encountered at a depth of about five feet. Mr. Bowles informed me that a long-time employee of Apex Fuel Company claims that Union Electric Company once used a building at this particular site to store transformers. The

basement of this building was said to be full of waste oil when the building was demolished several years ago. Mr. Bowles indicated that the foundation or basement of this demolished building might explain the IR/T anomaly.

I asked Mr. Gehm about the capabilities of the IR/T and if it could image at depths of several feet. He said that he thought that the IR/T could image areas of dissimilar makeup to a depth of about 20 feet. Mr. Bowles added that buried objects as small as five-gallon buckets have been identified with the instrument. Mr. Gehm said that the IR/T images are taken using a lift bucket and are taken at a height of about 30 feet above the ground.

At 10:15 a.m., Mr. Gehm and Mr. Bowles said that they had to leave to finish with the removal of the waste oil. I thanked them for their assistance and told them that I would stay in touch with them. After taking more photographs of the area, I then left the site at approximately 11:00 a.m.

DF:so

LATITUDE AND LONGITUDE CALCULATION WORKSHEET #2
LI USING ENGINEER'S SCALE (1/60)

SITE NAME: Mound Street PCB's CERCLIS #: MO000009367

AKA: _____ SSID: _____

ADDRESS: 100 Mound Street

CITY: St. Louis STATE: MO ZIP CODE: 63102

SITE REFERENCE POINT: Center of former Union Electric Property.

USGS QUAD MAP NAME: Granite City, IL TOWNSHIP: 45 (N)/S RANGE: 7 (E)/W

SCALE: 1:24,000 MAP DATE: 1954 SECTION: ____ 1/4 ____ 1/4 ____ 1/4

MAP DATUM: (1927) 1983 (CIRCLE ONE) MERIDIAN: 5th Principal

COORDINATES FROM LOWER RIGHT (SOUTHEAST) CORNER OF 7.5' MAP (attach photocopy):

LONGITUDE: 90 ° 07 ' 30 " LATITUDE: 38 ° 37 ' 30 "

COORDINATES FROM LOWER RIGHT (SOUTHEAST) CORNER OF 2.5' GRID CELL:

LONGITUDE: 90 ° 10 ' 00 " LATITUDE: 38 ° 37 ' 30 "

CALCULATIONS: LATITUDE (7.5' QUADRANGLE MAP)

A) NUMBER OF RULER GRADUATIONS FROM LATITUDE GRID LINE TO SITE REF POINT: 195

B) MULTIPLY (A) BY 0.3304 TO CONVERT TO SECONDS:

A x 0.3304 = 64 . 42 "

C) EXPRESS IN MINUTES AND SECONDS (1'= 60"): 1 ' 4 . 42 "

D) ADD TO STARTING LATITUDE: 38 ° 37 ' 30 . 00 " + 1 ' 4 . 42 =

SITE LATITUDE: 38 ° 38 ' 34 . 00 "

CALCULATIONS: LONGITUDE (7.5' QUADRANGLE MAP)

A) NUMBER OF RULER GRADUATIONS FROM RIGHT LONGITUDE LINE TO SITE REF POINT: 173

B) MULTIPLY (A) BY 0.3304 TO CONVERT TO SECONDS:

A x 0.3304 = 57 . 15 "

C) EXPRESS IN MINUTES AND SECONDS (1'= 60"): 0 ' 57 . 15 "

D) ADD TO STARTING LONGITUDE: 90 ° 10 ' 00 . 00 " + 0 ' 57 . 15 =

SITE LONGITUDE: 90 ° 10 ' 57 . 15 "

INVESTIGATOR: Don Falls DATE: 12/13/93

Reference 9

ACTIVITIES REPORT
TRRA of St. Louis
First & Mound Streets Site
MDNR Spill Report
07143 - KB - 1331

The GEHM Corporation
1417 Bingham Rd.
P.O. Box 65
Boonville, MO 65233

THE GEHM Corporation

TABLE OF CONTENTS

ACTIVITIES REPORT
TRRA of St. Louis
First & Mound Streets Site
MDNR SPILL REPORT # 07143 - KB -1331

1.0 PROJECT SYNOPSIS

This is a report of activities and findings resulting from the discovery of oils seeping into a pump station operated by Metropolitan Sewer District (MSD) in St. Louis, Missouri. On July 14, 1993, MSD reported this situation to the MDNR. MSD analytical information revealed PCB levels of less than 50 ppm in the oils seeping into the pump station. Additionally, a sample was obtained from waste oil contained in an underground storage tank present in the area, and owned by Terminal Railroad Association of St. Louis (TRRA). The St. Louis Fire Department (SLFD) notified TRRA on July 28, 1993 and requested the contents of the tank be removed. TRRA was unaware of the existence of the tank prior to notification by the SLFD.

In response to the situation, TRRA initiated and completed the following tasks:

- **Contents of the tank were removed** on August 4, 1993. The tank was completely cleaned and freed of all liquids. The material was containerized on-site in 55 gallon drums for characterization and disposal.

- An **Infrared Thermographic Survey was conducted** of the area in an attempt to characterize leak plumes or trails.

- **Three borings** were advanced in the immediate area to determine subsurface soil conditions. Two soil samples were obtained from the site and submitted to a qualified laboratory for chemical analysis.

This report documents the response efforts and findings of the investigatory activities.

2.0 DESCRIPTION OF SURROUNDING PROPERTIES

The property is bordered by gravel roads on the north, east, and south sides. To the west is a gravel covered area containing truck scales and operated by Apex Oil Co. Across the road (Mound Street), and to the south is an empty lot formerly occupied by Union Electric Company of Missouri. To the east are several sets of railroad tracks immediately adjacent to the flood wall. To the north (across Brooklyn Street), is a facility operated by Continental Cement Company (apparently used for cement loading/unloading). The MSD Pump Station is situated adjacent to the flood wall and approximately 400-500 ft. north-east of the tank location. Southwest of the property (across Mound street) is a bulk petroleum storage/distribution facility. This facility is characterized by several large

(>500,000 gallon capacity) above ground storage tank systems.

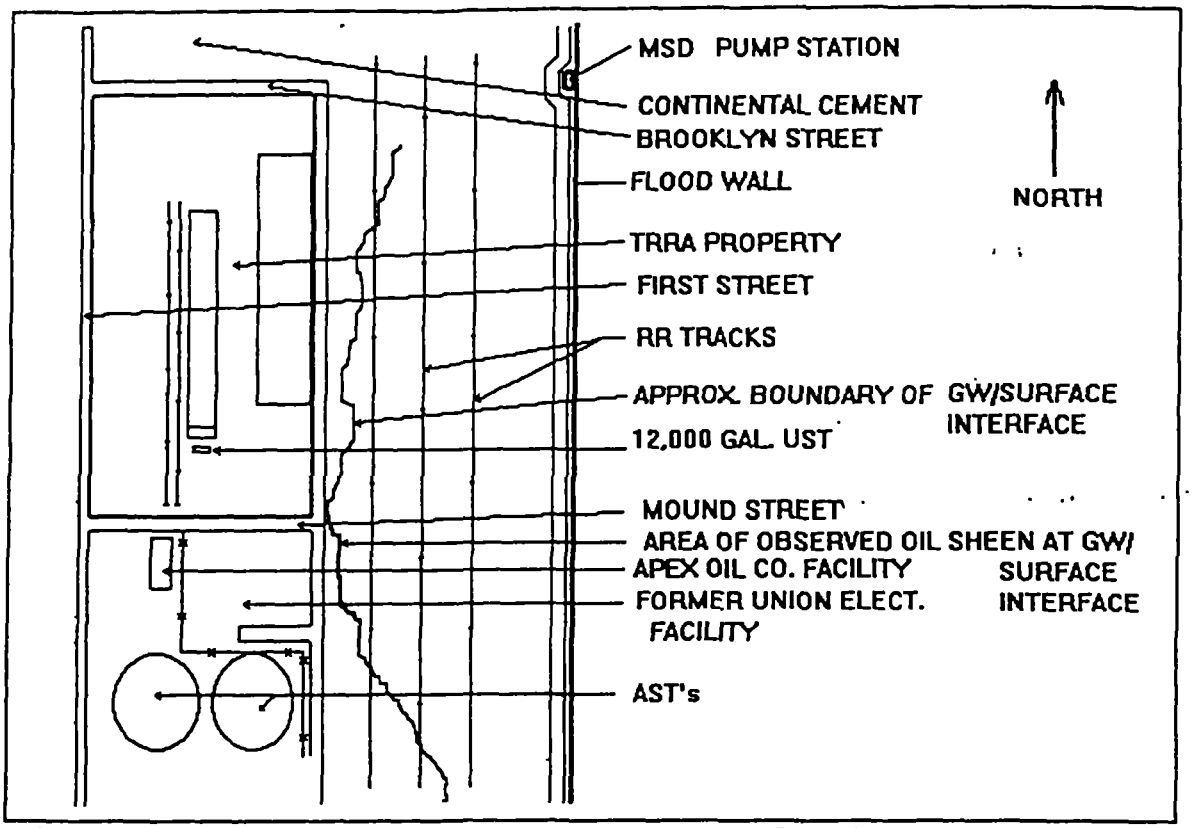


FIGURE 1: AREA SKETCH SHOWING PROPERTY AND SURROUNDING PROPERTIES. (APPROX. SCALE: 1"=180')

Numerous combined sewer, water and other utilities exist (some abandoned) throughout the area which were not completely defined for this report. Utilities which were obvious from site observations and from conversations with MSD personnel included a sewer line adjacent to the TRRA property along Mound Street, and a main line extending west from the pump station. Several underground utility lines run parallel to the railroad tracks and flood wall in a north - south direction. A TRRA property drawing identified a vitrified pipe drain traversing the site from approximately the tank location to the southeast corner of the property (copy provided in attachments). No attempts were made intrusively to locate and verify the existence of this pipe, however, IR/T did not provide a signature typical of an underground conduit acting as a migratory pathway.

A slight gradient (approx. 1:20) typifies the immediate area from west to east.

Groundwater was encountered on the site at a depth of 8 to 8.5 feet from surface. However, site activities were conducted one day following the crest of the Mississippi River on August 1, 1993. Evidence of extreme hydrostatic pressure in the area was observed by water shooting approximately 10 feet high from a Corps of Engineers piezometer located adjacent to the flood wall (approximately 400 feet from the UST), and by a groundwater/surface interface along the area between the eastern most road and the railroad tracks (see Figure 1). Observations of this interface revealed an apparent petroleum sheen present in many areas where the groundwater was seeping from the

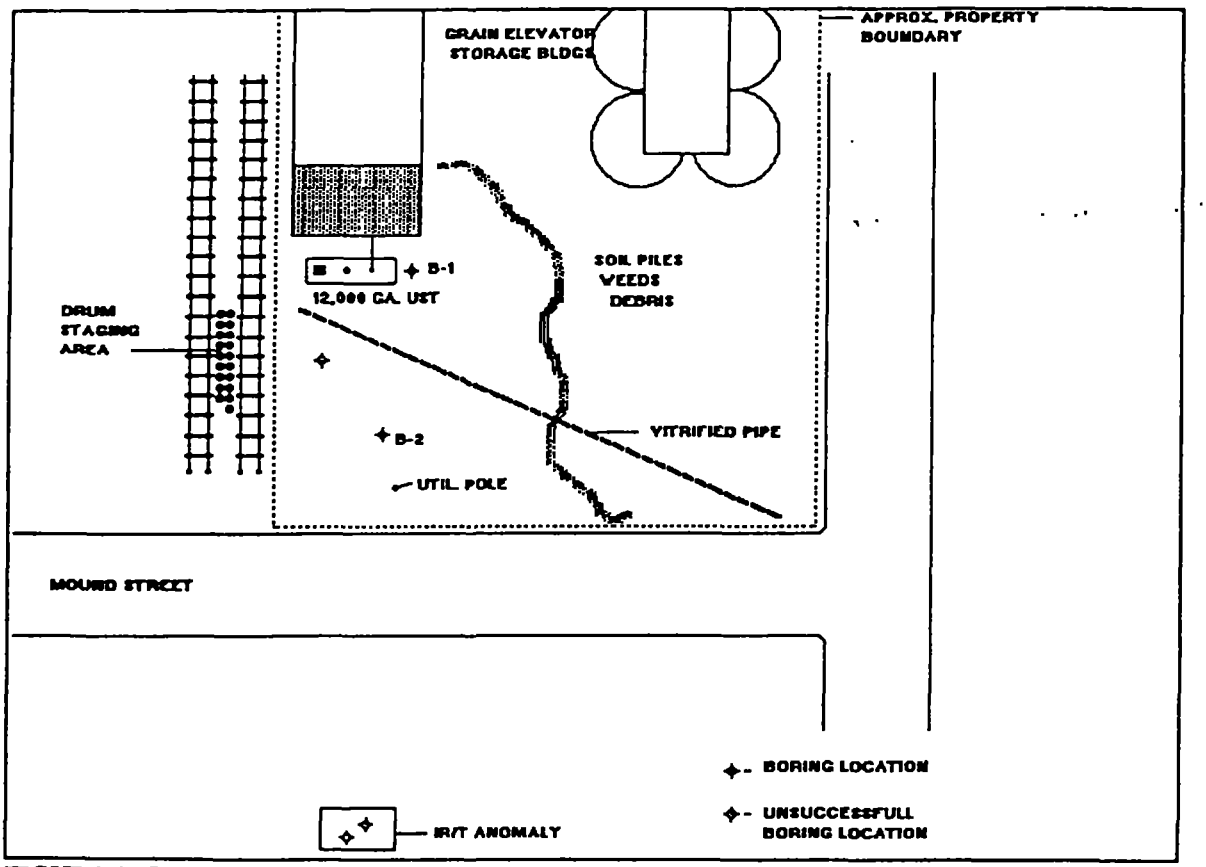


FIGURE 2: SITE SKETCH DEPICTING PROMINENT FEATURES. (APPROX. SCALE: 1"=200')

interface. A sheen was observed in an area extending from a line approximately even with the south side of the TRRA property, south to a line approximately even with the south side of the former Union Electric property.

3.0 SITE DESCRIPTION

The parcel of property identified as TRRA property and where the UST exists, measures approximately 150 ft. by 340 ft. The property is generally situated in a north-south direction between the ends of Mound and Brooklyn Streets, St. Louis County, St. Louis, Missouri. Two structures are on the property which appear to be abandoned grain elevator and storage/handling structures constructed of reinforced concrete. The larger of the two structures measures approximately 40 ft. by 160 ft. and is situated along the east side of the property. The smaller structure measures approximately 20 ft. by 170 ft., is situated along the west side of the property with the UST located at the south end. A railroad siding runs adjacent to this smaller structure as well.

4.0 SITE ACTIVITIES

The purpose of the site activities was twofold. First was in response to the requests of the SLFD assuming the tank as the most likely source of the contaminants entering the MSD pump station, and secondly, to assess the most likely migratory pathway of the contaminants for the purpose of determining the most effective abatement measures.

4.1 Tank Contents Removal.

On August 4, 1993, field personnel were mobilized to the site to conduct removal of the tank contents and cleaning of the tank. This procedure was accomplished by Environmental Operations, St. Louis, Missouri. A vacuum truck was used to pump material from the tank then placed in 55 gallon drums, staged on site. The tank was entered, following Confined Space Entry Procedures to remove and clean the remaining product and debris. Samples of the waste were obtained and submitted to American Interplex Corporation for analyses and summarized in the following table.

TANK WASTE ANALYSIS SUMMARY			
PARAMETER	UNIT	RESULT	METHOD
IGNITABILITY	°F	Non-ignitable below 212	EPA 1010
TOTAL HALIDES	mg/Kg	880	EPA 9020
PCB	mg/Kg	<10	EPA 600/4-81/045
HEAT CONTENT	BTU/lb	9480	ASTM D240
TCLP:			EPA 1311 (FEDERAL REGISTER/VOL. 57, NO. 227/NOVEMBER 24, 1992), 3010A, 6010A, 7470.
SILVER	mg/l	<.007	
ARSENIC	mg/l	<.02	
BARIUM	mg/l	2.1	
CADMIUM	mg/l	.019	
CHROMIUM	mg/l	.0096	
MERCURY	mg/l	<.01	
LEAD	mg/l	<.1	
SELENIUM	mg/l	<.02	

Note: Analysis parameters were selected for the purpose of determining disposal options.

Sixteen drums (approximately 880 gallons) of sludge/liquid, and one drum containing solid debris were generated. The waste was dual phased consisting of 60% ethylene glycol and 40% waste oils (based on appearance).

The tank system was constructed of steel and riveted with the top of the tank at ground surface. An eighteen inch diameter manway centered the tank with a two inch line extending from the tank, above grade, through the wall of the nearby structure. Tank dimensions were 10.5' dia., and 18.5' in length providing a capacity of 12,000 gallons. Tank depth was at 10.5 feet from surface.

4.2 Infrared Thermographic Survey (IR/T).

An Infrared Thermographic Survey was conducted in the immediate area on August 17, 1993 by EnTech Engineering, Inc. Infrared Thermography (IR/T) was selected to be performed at this site due to its ability to provide on-site, real time data. IR/T measures the heat energy emitted from the earths surface stored during daylight hours. Areas of dissimilar chemical or physical make-up (such as petroleum contaminated soils versus non-petroleum contaminated soils) emits stored heat energy at different rates. IR/T is used to identify potential contaminated areas in relation to a known source such as an Underground Storage Tank, Pipeline, etc.

The results of the IR/T investigation for this site did not portray evidence of a leak

plume, trail or other leak signature which would suggest a release capable of migrating from the UST to any point off-site.

The investigation did, however, indicate an anomaly on the former Union Electric Company property south of the TRRA property (see Figure 2). An area measuring approximately 10' x 10' was identified. IR/T cannot identify the cause of an anomaly without either an intrusive investigation or knowledge of a potential source of an anomaly. At the request and permission of Inspector Charles Gay (SLFD), this area was investigated and described in section 4.3.

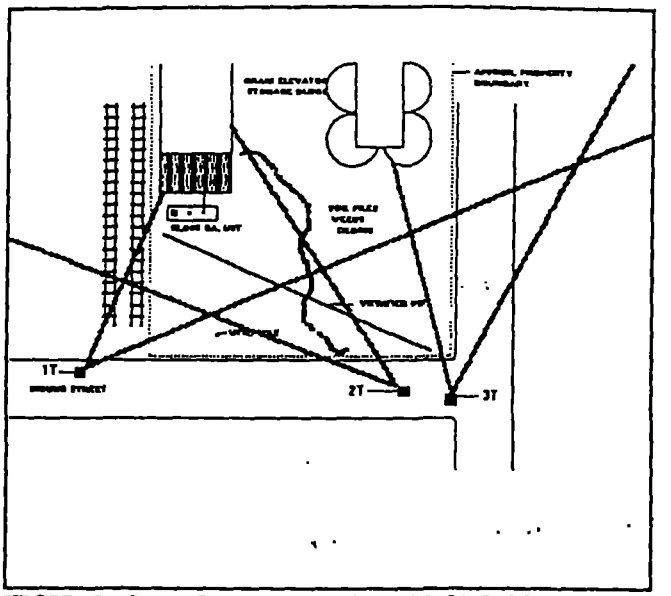
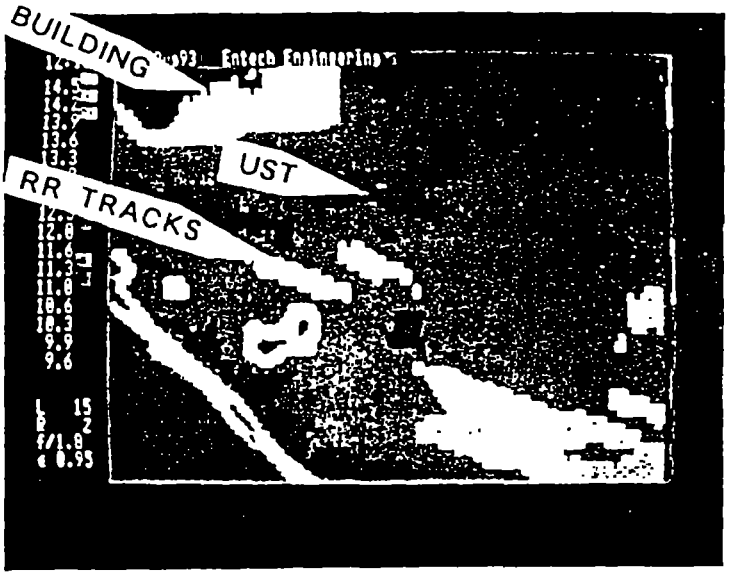


FIGURE 3: SITE SKETCH SHOWING AREAS DEPICTED ON IR/T THERMOGRAMS.

From the IR/T data generated, three views were selected for presentation in this report. These views are depicted on the following site sketch and the thermograms are presented on the following pages. The data was gathered between 11:00 p.m and midnight from a lift truck at approximately 30'. The corresponding photographs are provided for the purpose of reference.

EnTech
gineering, Inc.
PECIALISTS IN NON-DESTRUCTIVE TESTING • 111 Marine Lane • St. Louis, MO 63146 • U.S.A. • (314) 434-5255 • FAX: (314) 434-3270



VISUAL IMAGE NUMBER: 1V THERMOGRAM IMAGE NUMBER: 1T

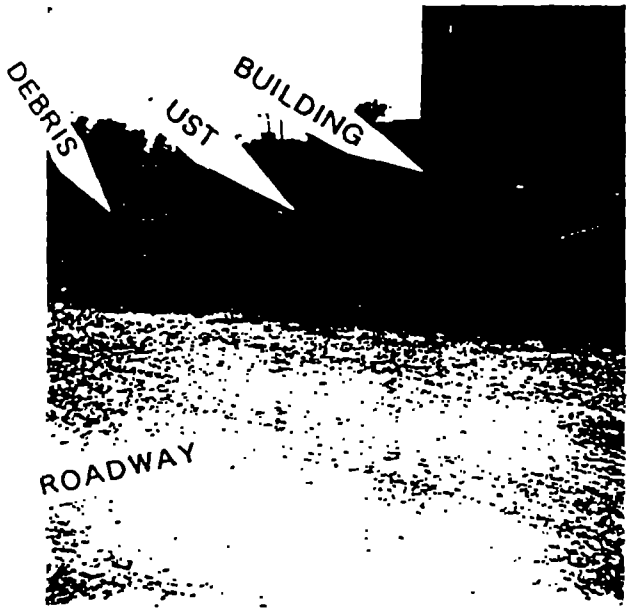
LOCATION: Terminal R.R.
1st and Mound Street
St. Louis, Missouri

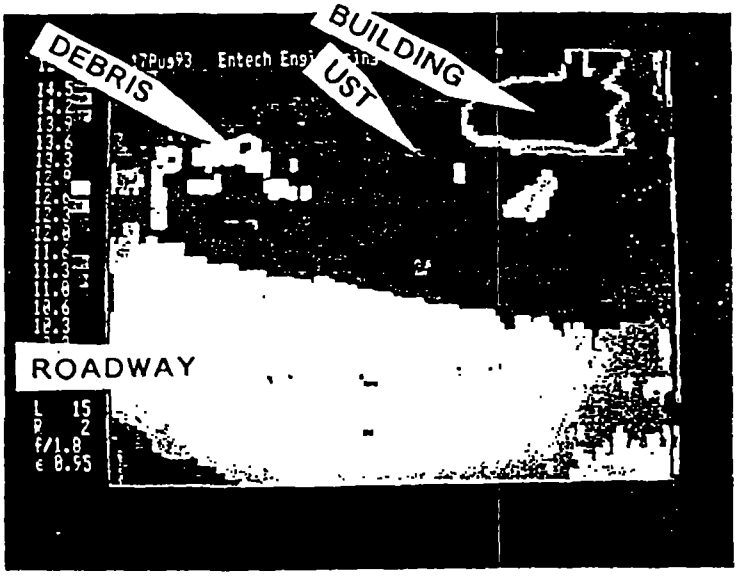
ITEM: Example data image

LOCATION: Refer to drawing item #1

INVESTIGATION DATE: 8/17/93

EnTech Engineering, Inc.
SPECIALISTS IN NON-DESTRUCTIVE TESTING • 111 Marine Lane • St. Louis, MO 63146 • U.S.A. • (314) 434-5255 • FAX: (314) 434-3270





VISUAL IMAGE NUMBER: 2V THERMOGRAM IMAGE NUMBER: 2T

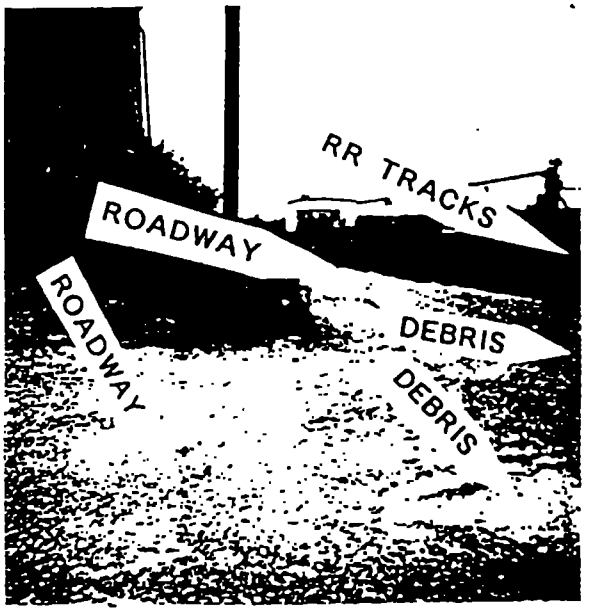
LOCATION: Terminal R.R.
1st and Mound Street
St. Louis, Missouri

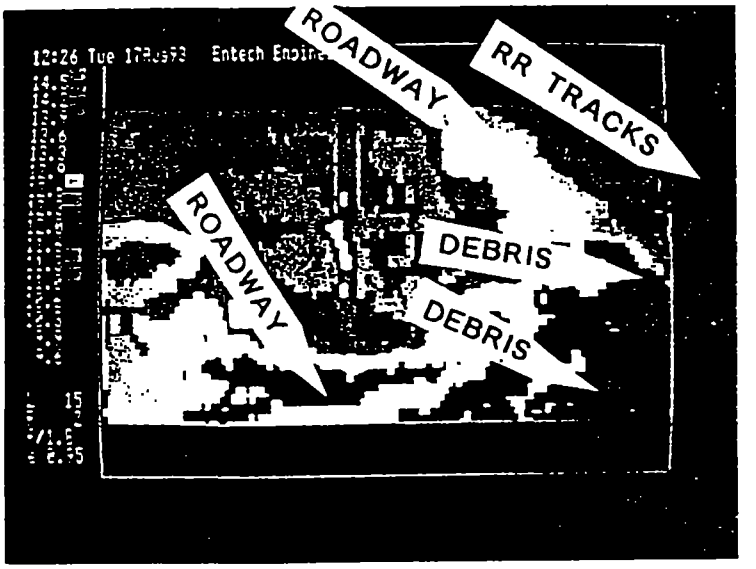
ITEM: Example data image

LOCATION: Refer to drawing item #2

INVESTIGATION DATE: 8/17/93

EnTech Engineering, Inc.
SPECIALISTS IN NON-DESTRUCTIVE TESTING • 111 Marine Lane • St. Louis, MO 63146 • U.S.A. • (314) 434-5255 • FAX: (314) 434-3270





VISUAL IMAGE NUMBER: 3V THERMOGRAM IMAGE NUMBER: 3T

LOCATION: Terminal R.R.
1st and Mound Street
St. Louis, Missouri

ITEM: Example data image

LOCATION: Refer to drawing item #3

INVESTIGATION DATE: 8/17/93

4.3 Drilling/Sampling.

On August 4, 1993, a drilling crew was mobilized to the site and a total of five boring attempts were made. Three attempts were unsuccessful with auger refusal at five feet. One unsuccessful attempt was made on site approximately 30 feet south of the west end of the tank. Solid debris was encountered to a depth of 5 feet and the attempt was abandoned. At the request and permission of Inspector Charles Gay (SLFD), two other attempts were made in the area of the IR/T anomaly discovered within the former Union Electric Property. Both attempts were abandoned at a depth of 5 feet encountering solid rock debris.

The two successful attempts were located at the east (down gradient) end of the tank location, and approximately 37.5 feet south of the tank location. One sample was obtained from each of these borings and submitted to a qualified laboratory per analysis presented in the following table

SAMPLE RESULTS SUMMARY TABLE
(in ppm)

I.D	LOCATION	TPH	PCB	BENZENE	TOLUENE	E. BENZENE	XYLENES
01	10 FT. DEPTH	67	<0.05	<0.002	<0.002	<0.002	<0.002
02	8 FT. DEPTH	23	<0.05	<0.002	<0.002	<0.002	<0.002

5.0 SUMMARY/DISCUSSION

Analysis of the tank contents reveal a mixture of Ethylene Glycol (Antifreeze) and Waste Oil and should be disposed of in accordance with State and Federal Regulations.

The tank is scheduled for removal the first of October, 1993. Removal will be in accordance with MDNR UST Closure Guidance.

Results of site activities suggest the tank as the source of the oil seepage into the pump station unlikely for the following reasons:

- The pump station is located topographically upgradient from the UST.
- Soil sample results are not indicative of a release sufficient to supply free product from the UST to the pump station.

- IR/T failed to reveal anomalies on or around the site indicative of a leak plume, trail or signature.

- Water was not present in the tank. (Given the depth to groundwater 8.5', and depth to the tank bottom, 10.5', and the extreme amount of hydrostatic pressure in the area.)

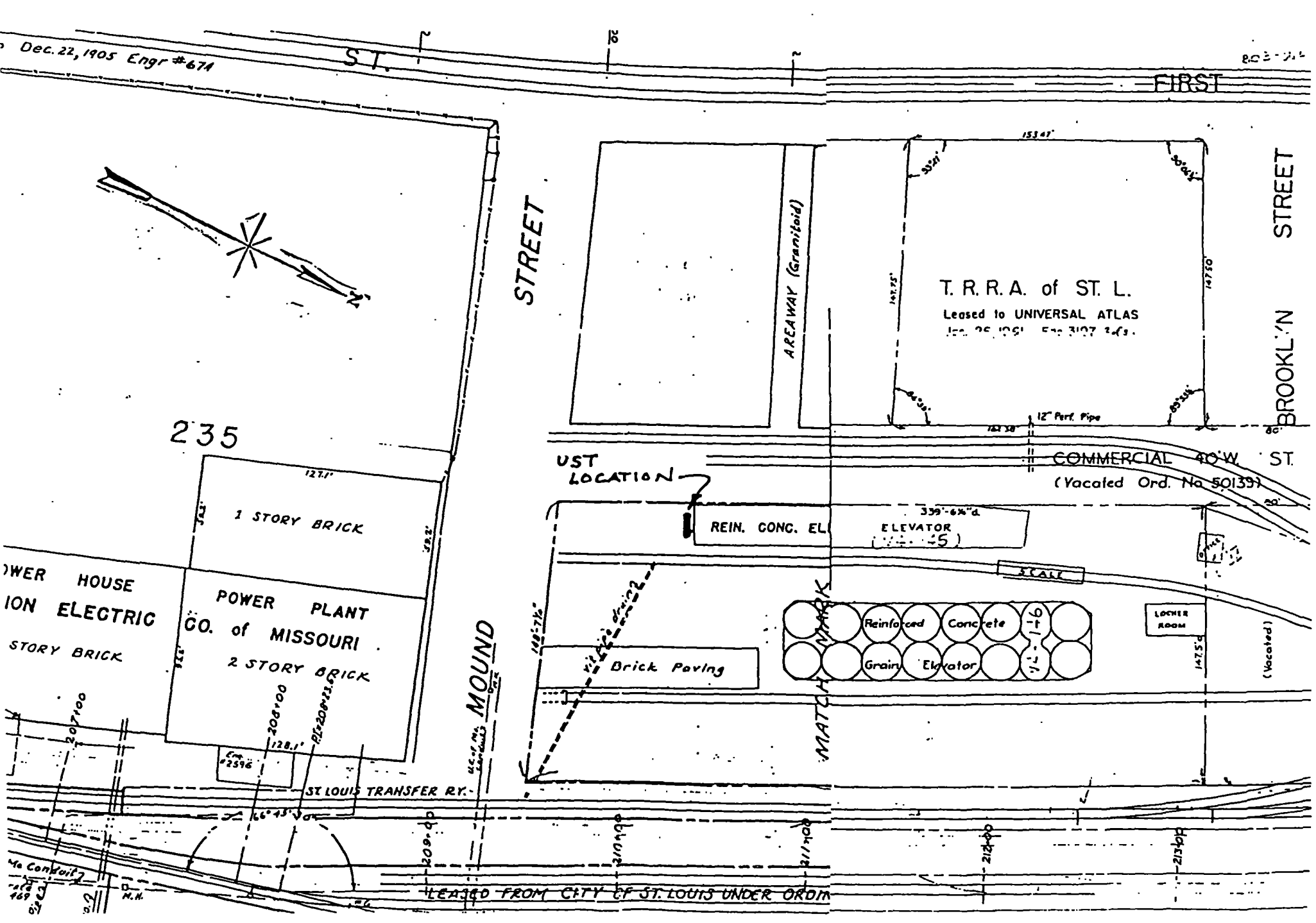
Additionally, the presence of the sheen at the groundwater/surface interface suggests a problem much more widespread than that of a single source. It is likely, the rising groundwater from the effects of the flooding in the immediate area had a direct affect on the sudden presence of the oil in the pump station.

Report Distribution List:

1. Ms. Kris Davidson, Environmental Specialist
   Missouri Department of Natural Resources
   Hazardous Waste Program - Superfund Section
   P.O. Box 176
   Jefferson City, Missouri 65102

2. Mr. Charles Gay, Fire Inspector
   St. Louis Fire Department
   Fire Prevention Bureau
   1421 N. Jefferson
   St. Louis, Missouri 63106

3. Mr Bob Ripper
   Terminal Railroad Association of St. Louis
   700 North Second Street
   St. Louis, Missouri 63102


Dec. 22, 1905 Engr #671
ST.
FIRST
STREET
AREAWAY (Granitoid)
T. R. R. A. of ST. L.
Leased to UNIVERSAL ATLAS
BROOKLYN STREET
235
1 STORY BRICK
POWER PLANT
CO. of MISSOURI
2 STORY BRICK
OWER HOUSE
ION ELECTRIC
STORY BRICK
MOUND
UST LOCATION
REIN. CONC. EL
ELEVATOR
COMMERCIAL 40'W. ST.
(Vacated Ord. No 50139)
Brick Paving
Reinforced Concrete
Grain Elevator
LOCKER ROOM
(Vacated)
MATCH LINE
ST LOUIS TRANSFER RY.
LEASED FROM CITY OF ST. LOUIS UNDER ORDIN

GHEM CORPORATION
RAIL ROAD - ST. LOUIS

DEPTH IN FEET	DESCRIPTION OF MATERIAL	SAMPLES	STANDARD PENETRATION RESISTANCE (ASTM D 1586) △ • BLOWS PER FOOT 10 20 30 40 50
	Black Silty Soils W/Const. Debris and Red Brick Debris to 10'		
5			
	Groundwater 8.5'		
10		SS 10'	
	Terminate Boring 10'		
15			
20			
25			
30			
35			

GROUNDWATER DATA

COUNTERED AT 8.5' FEET

_____ FEET AFTER _____ HOURS

_____ FEET AFTER _____ HOURS

_____ FREE WATER NOT ENCOUNTERED DURING DARLING

Environmental Operations, Inc.
2649 Postalozzi St. Louis MO 63118

DATE: 3/5/93 | PROJECT NO: 5780

DRILLER: GB | LOGGER: GB | AUGER: SF

SURFACE ELEVATION: | HOLLOW STEM:

Boring No. .01

DEPTH IN FEET	DESCRIPTION OF MATERIAL	SAMPLES	STANDARD PENETRATION RESISTANCE (ASTM D 1586) △ = BLOWS PER FOOT 10 20 30 40 50
	Black Silty Soil w/Const. Debris to 3'		
	Refusal 3'		
5			
10			
15			
20			
25			
30			
35			

GROUNDWATER DATA

ENCOUNTERED AT _____ FEET

AT _____ FEET AFTER _____ HOURS

AT _____ FEET AFTER _____ HOURS

_____ FREE WATER NOT ENCOUNTERED DURING DRILLING

Environmental Operations, Inc.

2649 Postwood St. Louis MO 63118

DATE: 8/5/93 | PROJECT NO: 5780

DRILLER: GB | LOGGER: GB | AUGERS: SF

SURFACE ELEVATION: | HOLLOW STEM:

Boring No. .02

DEPTH IN FEET	DESCRIPTION OF MATERIAL	SAMPLES	STANDARD PENETRATION RESISTANCE (ASTM D 1586) △ = BLOWS PER FOOT 10 20 30 40 50
	Black Silty Clay to 8'		
5		SS x 2@8'	
	Terminate Boring 8'		
10			
15			
20			
25			
30			
35			

GROUNDWATER DATA

ENCOUNTERED AT 8.5' FEET

AT _____ FEET AFTER _____ HOURS

AT _____ FEET AFTER _____ HOURS

_____ FREE WATER NOT ENCOUNTERED DURING DRILLING

Environmental Operations, Inc.

2649 Postaweil St. Louis MO 63118

DATE: 8/5/93 | PROJECT NO.: 5780

DRILLER: GB | LOGGER: GB | AUGER: SF

SURFACE ELEVATION: | HOLLOW STEM:

Boring No. .03

DEPTH IN FEET	DESCRIPTION OF MATERIAL	SAMPLES	STANDARD PENETRATION RESISTANCE (ASTM D 1586) △ - BLOWS PER FOOT 10 20 30 40 50
	Black Silty Clay w/Const. Debris to 8'		
5		SS 8'	
	Terminate Boring 8'		
10			
15			
20			
25			
30			
35			

GROUNDWATER DATA

ENCOUNTERED AT _____ FEET

AT _____ FEET AFTER _____ HOURS

AT _____ FEET AFTER _____ HOURS

_____ FACE WATER NOT ENCOUNTERED DURING DRILLING

Environmental Operations, Inc.

2649 Postaboard St. Louis MO 63118

DATE: 8/5/93 | PROJECT NO.: 5780

DRILLER: GB | LOGGER: GB | AUGER:

SURFACE ELEVATION: | HOLLOW STEM: H.S

Boring No. .04

DEPTH IN FEET	DESCRIPTION OF MATERIAL	SAMPLES	STANDARD PENETRATION RESISTANCE (ASTM D 1586) △ = BLOWS PER FOOT 10 20 30 40 50
	Brown Clay w/Rock Debris To 3'		
	Refusal 3'		
5			
10			
15			
20			
25			
30			
35			

GROUNDWATER DATA

ENCOUNTERED AT _____ FEET

_____ FEET AFTER _____ HOURS

_____ FEET AFTER _____ HOURS

_____ FREE WATER NOT ENCOUNTERED DURING DRILLING

Environmental Operations, Inc.

2649 Postmark St. Louis MO 63118

DATE: 8/5/93 | PROJECT NO.: 5780

DRILLER: GB | LOGGER: GB | AUGER: SF

SURFACE ELEVATION: | HOLLOW STEM

Boring No. .05

DEPTH IN FEET	DESCRIPTION OF MATERIAL	SAMPLES	STANDARD PENETRATION RESISTANCE (ASTM D 1586) △ = BLOWS PER FOOT 10 20 30 40 50
	Brown Clay w/Const. Debris to 5'		
5	Refusal 5'		
10			
15			
20			
25			
0			
5			

GROUNDWATER DATA

_____ FEET

_____ FEET AFTER _____ HOURS

_____ FEET AFTER _____ HOURS

_____ FREE WATER NOT ENCOUNTERED DURING DRILLING

Environmental Operations, Inc.
2649 Postaloozi St. Louis MO 63118

DATE: 8/5/93 | PROJECT NO.: 5780

DRILLER: GB | LOGGER: GB | AUGER: SF

SURFACE ELEVATION: | HOLLOW STEM:

Boring No. .06

AMERICAN INTERPLEX CORPORATION
LABORATORIES

8600 Kanis Road
Little Rock, AR 72204-2322
(501) 224-5060

The Gehm Corporation (C-1270)
Post Office Box 65
Boonville, MO 65233

August 16, 1993

ATTN: Mr. Daryl Bowles

Control No. 3520

Sample Description: Two (2) soil received on 8/9/93
Re: Terminal Rr Assoc. of St. Louis Mound & First Streets
(Site) St. Louis, MO Project No. 0116
P.O. No. 080-693 116

Result:

Parameter	Unit	01 8-4-93 0930	02 8-4-93 0945
Total Petroleum Hydrocarbons	mg/Kg	67	23
PCB	mg/Kg	<0.05	<0.05
Benzene	mg/Kg	<0.002	<0.002
Toluene	mg/Kg	<0.002	<0.002
Ethylbenzene	mg/Kg	<0.002	<0.002
m- & p-Xylenes	mg/Kg	<0.002	<0.002
o-Xylenes	mg/Kg	<0.002	<0.002

Method: Modified EPA 418.1, EPA 3550, 8080, 5030, 8020

Remark: Results are presented on an as-received basis.

Enclosure: Chain of custody

AMERICAN INTERPLEX CORPORATION

MWM/tj

By Michael W. McNerlin
Michael W. McNerlin
Laboratory Director

GEHM Corporation

REQUEST

Submitted by: (Name/Telephone/Date)	Lab: (Name/Address/Telephone)	Client Name/Project Location: (Contact/Phone #)
THE GEHM CORPORATION 1417 BINGHAM RD., P.O. BOX 65 BOONVILLE, MO 65233-0065 DARYL BOWLES 816-882-3485	AMERICAN INTERPLEX CORP. 8600 KANIS RD. LITTLE ROCK, AR. 72204-2322	TERMINAL RR ASSOC. OF ST. LOUIS MOUND & FIRST STREETS (SITE) ST. LOUIS, MO. BOB RIPPER 314-539-4712

Project No.:	Applicable Regulatory No.:	P.O. #: (For Lab)	Samplers Signature:
0116	07143-KB-1331	080-693 116	Daryl K. Bowles

	Sample ID	Matrix	Preservative	Date	Time	ANALYSIS REQUEST: BTEX (8020)	TPH (418.1)	TPH MO_MOD (418.1)	OA-1 (SOWA)	OA-2 (SOWA)	TOG (413.1)	PCB CONT. (8080)	OTHER	OTHER	OTHER
(1)	01	SOIL	ICE	8-4-93	0930	X		X				X			
(2)	02	SOIL	ICE	8-4-93	0945	X		X				X			

COMMENTS/SPECIAL INSTRUCTIONS:
- NORMAL TURN AROUND
- PLEASE FAX RESULTS TO: DARYL BOWLES 816-882-5766

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Daryl K. Bowles	8-6-93	1100	Martha Lucio	08-07-93	0815

AMERICAN INTERPLEX CORPORATION
LABORATORIES

8600 Kanis Road
Little Rock, AR 72204-2322
(501) 224-5060

The Gehm Corporation (C-1270)
Post Office Box 65
Boonville, MO 65233

August 20, 1993

ATTN: Mr. Daryl Bowles

Control No. 3586

Sample Description: One (1) glycol/oil collected by Environmental Operations received on 8/12/93
Re: Gehm Corp 0111

Result:

Parameter	Unit	5780	Regulatory Level
Ignitability	°F	Non-Ignitable below 212	-
Toxicity Characteristic Leaching Procedure			
Solids	%	100	-
Silver	mg/l	<0.007	5.0
Arsenic	mg/l	<0.2	5.0
Barium	mg/l	2.1	100.0
Cadmium	mg/l	0.019	1.0
Chromium	mg/l	0.0096	5.0
Mercury	mg/l	<0.01	0.2
Lead	mg/l	<0.1	5.0
Selenium	mg/l	<0.2	1.0

Method: EPA 1010, EPA 1311 (Federal Register/Vol. 57, No. 227/November 24, 1992), 3010A, 6010A, 7470

Enclosure: Chain of custody

AMERICAN INTERPLEX CORPORATION

SL/tm

By Steven Lovell
Steven Lovell
Technical Director

AMERICAN INTERPLEX CORPORATION
LABORATORIES

8600 Kanis Road
Little Rock, AR 72204-2322
(501) 224-5060

The Gehm Corporation (C-1270)
Post Office Box 65
Boonville, MO 65233

August 20, 1993

ATTN: Mr. Daryl Bowles

Control No. 3521

Sample Description: One (1) oil/glycol received on 8/9/93
P.O. No. 050593 DB

Result:

Parameter	Unit	TANK WASTE 8-04-93 1000
Total Halides	mg/Kg	880
PCB	mg/kg	<10
Heat Content	BTU/lb	9480

Method: EPA 9020, 600/4-81/045, ASTM D240

Remark: As requested analysis for Toxicity Characteristic Leaching Procedure and Flash Point was performed on additional sample referenced American Interplex Corporation Control No. 3586. Analysis performed on oil layer only.

Enclosure: Chain of Custody

AMERICAN INTERPLEX CORPORATION

SL/tm

By Steven Lovell
Steven Lovell
Technical Director

GEHM Corporation

REQUEST

Submitted by: (Name/Telephone)	Lab: (Name/Address/Telephone)	Client Name/Project Location: (Contact/Phone #)
DARYL R. BOWLES, CHMM THE GEHM CORPORATION P.O. BOX 65 BOONVILLE, MO 65233 (816) 882-3485	American Interplex Corporation 8800 Kanis Rd. Little Rock, AR 72204-2322	Terminal Railroad Association of St. Louis First & Mound Streets St. Louis, MO Mr. Bob Ripper (314) 539-5196

Project No.: 0116	Applicable Regulatory No.: 07143-KB-1331	P.O. #: (For Lab) 050683 DB	Samplers Signature: Daryl R. Bowles

Sample ID	Matrix	Preservative	Date	Time	ANALYSIS REQUEST												
					BTEX (8020)	TPH (418.1)	TPH MO.MOD (418.1)	OA-1 (IOWA)	BTU VALUE	pH	TOX (CHLORINE)	FLASH POINT (CC)	PCB CONTENT (8080)	TCLP METALS*	OTHER	OTHER	OTHER
TANK WASTE	SLUDGE	N/A	08-04-93	1000					X		X	X	X	X			

COMMENTS/SPECIAL INSTRUCTIONS:
* METALS INCLUDED ARE: ARSENIC, BARIUM, CADMIUM, CHROMIUM, LEAD, MERCURY, SELINIUM, SILVER.

PLEASE FAX RESULTS TO: 816-882-5786

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Daryl R. Bowles	8-6-93	1100	Nathan Sivia	08-07-93	0915
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

[redacted]

CUSTODY TRANSFER RECORD/LABORATORY WORK REQUEST

COMPANY Environmental Operations CONTACT Michael Lechner PROJECT NO. 5780

ADDRESS 2649 Pestalozzi DATE 8-11-93 P.O. NO.

CITY/STATE/ZIP St Louis MO 63118 DUE DATE

PHONE (314) 771-8442 FAX ( )

(314) 771-5060

AICCN 3580

SPECIAL INSTRUCTIONS: ATTN: KRISTA

Reference: Gehm Corp. Soc.# 0111

SAMPLE IDENTIFICATION

ITEM	LAB NO.	SITE CODE/ SAMPLE DESCRIPTION	DATE COLLECTED	PRESERV.	CONTAINER	ANALYSES REQUESTED: TCLP METALS	ANALYSES REQUESTED: FLASH POINT	COMMENTS
1	(1)	70% Glycol / 30% waste oil	8-11-93		Glass 32oz	X	X	
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								

ITEMS TRANSFERRED	RELINQUISHED BY	Date	Time	RECEIVED BY	Date	Time	REASON for TRANSFER
				[signature]	8/11/93	1300	

Reference 10

THE GEHM Corporation
1417 Bingham Road
Post Office Box 65
Boonville, MO 65233

816-882-3485
816-882-5766 (Fax)

October 26, 1993

Ms. Kris Davidson, Environmental Specialist
Missouri Department of Natural Resources
Hazardous Waste Program - Superfund Section
P.O. Box 176
Jefferson City, Missouri 65102

RE: UST Removal Closure Report

Dear Ms. Davidson,

We are submitting the enclosed report on behalf of Terminal Railroad Association (TRRA) of St. Louis. The report contains soil sample analysis results as requested by TRRA. I hope you find this information useful in your investigation of the area.

Should you have any questions regarding this report or require additional information, please call me at (816) 882-3485.

Sincerely,

Daryl R. Bowles, CHMM
Director,
Environmental Field Services

cc: Mr Bob Ripper
Terminal Railroad Association of St. Louis
700 North Second Street
St. Louis, Missouri 63102

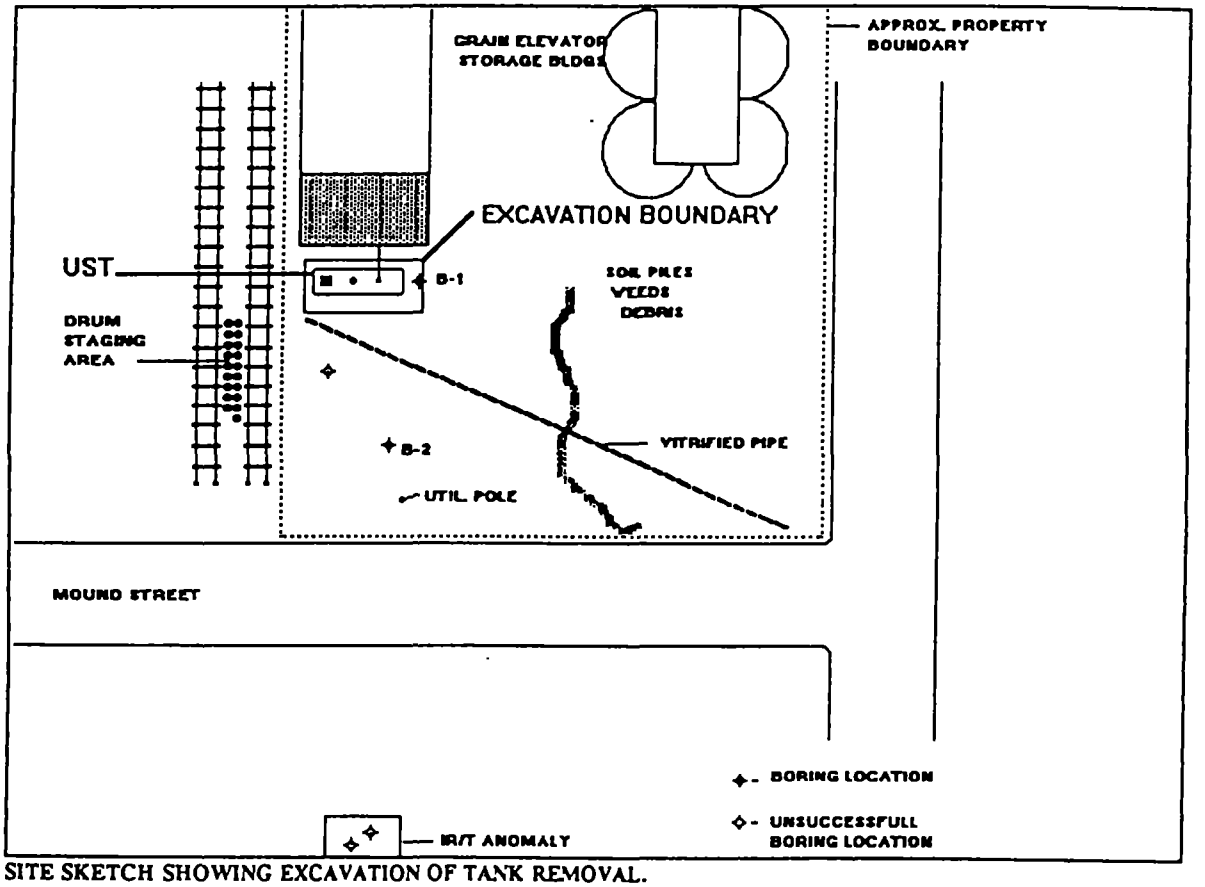
UST CLOSURE REPORT

for

Terminal Railroad Association

OWNER/FACILITY INFORMATION:

Facility Name:	NONE	UT# N/A	
Address	First & Mound Streets		
County St. Louis	City	St. Louis, MO	Zip Code 63102
Telephone/Contact	(314) 539-4712	Mr. Bob Ripper	
Date of Tank Removal	October 11, 1993		



SITE SKETCH SHOWING EXCAVATION OF TANK REMOVAL.

PROJECT SYNOPSIS

This underground storage tank removal project is a result of the discovery of oils seeping into a pump station operated by Metropolitan Sewer District (MSD) in St. Louis, Missouri. On July 14, 1993, MSD reported this situation to the MDNR. MSD analytical information revealed PCB levels of less than 50 ppm in the oils seeping into the pump station. Additionally, a sample was obtained from waste oil contained in an underground storage tank present in the area, and owned by Terminal Railroad Association of St. Louis (TRRA). The St. Louis Fire Department (SLFD) notified TRRA on July 28, 1993 and requested the contents of the tank be removed. TRRA was unaware of the existence of the tank prior to notification by the SLFD.

In response to the situation, TRRA initiated and completed the following tasks:

- **Contents of the tank were removed** on August 4, 1993. The tank was completely cleaned and freed of all liquids. The material was containerized on-site in 55 gallon drums for characterization and disposal.

- An **Infrared Thermographic Survey was conducted** of the area in an attempt to characterize leak plumes or trails.

- **Three borings** were advanced in the immediate area to determine subsurface soil conditions. Two soil samples were obtained from the site and submitted to a qualified laboratory for chemical analysis.

The results of these efforts are documented in an ACTIVITIES REPORT dated Setember 1, 1993 which documents the response efforts and findings of the investigatory activities.

This UST had no record of registration with the Missouri Department of Natural Resources. TRRA indicated no knowlege of the existence of the tank prior to notification by the SLFD. The UST removal project included removal of the soil overburden, removal of the tank, obtaining samples of the soils below the tank, on the down gradient wall and of the soil pile, disposal of the tank as scrap metal, and backfilling the excavation.

1.0 SAMPLE RESULTS

Soil sampling for this UST removal project included sampling below the tank and the down gradient wall. Additionally, one composite sample of excavated soil was obtained.

SAMPLE RESULTS SUMMARY TABLE
(in ppm)

I.D	LOCATION	TPH	BENZENE	TOLUENE	E. BENZENE	XYLENES	PCB's
PIT	FROM BELOW TANK, 2 COMPOSITE POINTS AT EACH END, OF NATIVE SOIL, 12FT. DEPTH	<5	<0.002	<0.002	<0.002	<0.004	<.05
DGW	FROM DOWN GRADIENT WALL (EAST WALL), 10.5 FT. DEPTH	< 5	<0.002	<0.002	<0.002	<0.004	<.05
SP	FROM FOUR COMPOSITE POINTS OF THE EXCAVATED SOILS	66	<0.002	0.002	<0.002	0.004	<.05

2.0 LOCATION OF LINES AND UTILITIES

Underground lines or utilities were not discovered in the immediate area during excavation activities. However, an area drawing supplied by TRRA denotes a vitrified pipe extending across the site. (See Sketch Section 5.0)

3.0 FORMER LOCATIONS OF TANK(S)

One 10,000 gallon tank was located at the south end of the eastern most building on the property. The tank overburden consisted of grass and soil. The product line extended north from the tank approximately 10 feet and entered the building through a concrete wall at ground elevation.

4.0 DEPTH & SIZE OF TANK

Tank capacity was 10,000 gallons. Dimensions were 10.5 ft. diameter by 18.5 ft long. The top of the tank was exposed at grade elevation.

5.0 EXCAVATION BOUNDARIES

The excavation was limited to that necessary for tank removal. This excavation extended approximately 4 feet beyond the outer limits of the tank to a depth of 12 feet. Final dimensions of the tank pit excavation was 16 ft wide, 25 feet long and 12 feet deep.

6.0 ABOVE GROUND TANKS & PIPING

There were no above ground tank systems at this site.

7.0 DISTANCE TO WELLS, STREAMS, AND LAKES.

There were no private drinking water wells, or lakes within .5 miles of the tank location. The site is adjacent to the Mississippi River approximately 1,000 feet to the east.

8.0 SOILS DESCRIPTION

Soils encountererd was black junk fill with cinders to a depth of 12 feet. Below, native soils consisted of typical river sands/silts.

9.0 PHOTOGRAPHS

PHOTO #1: NORTH EAST VIEW SHOWING TANK AT BEGINNING OF EXCAVATION.

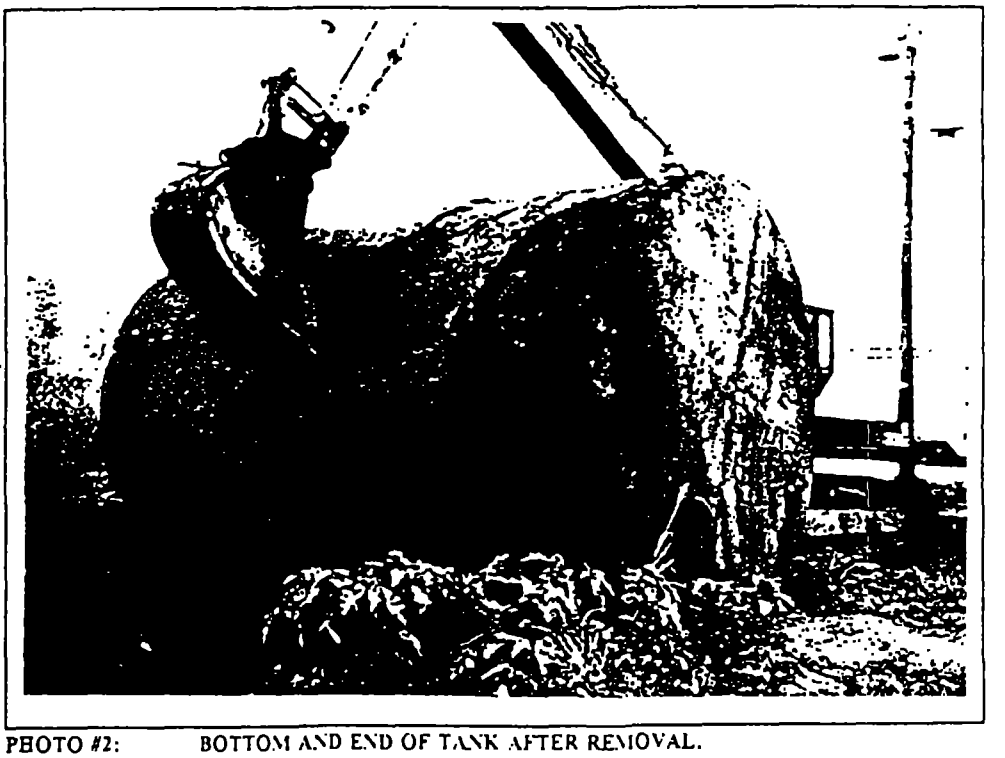


PHOTO #2: BOTTOM AND END OF TANK AFTER REMOVAL.

PHOTO #3: BOTTOM OF PIT AND EAST END OF EXCAVATION.

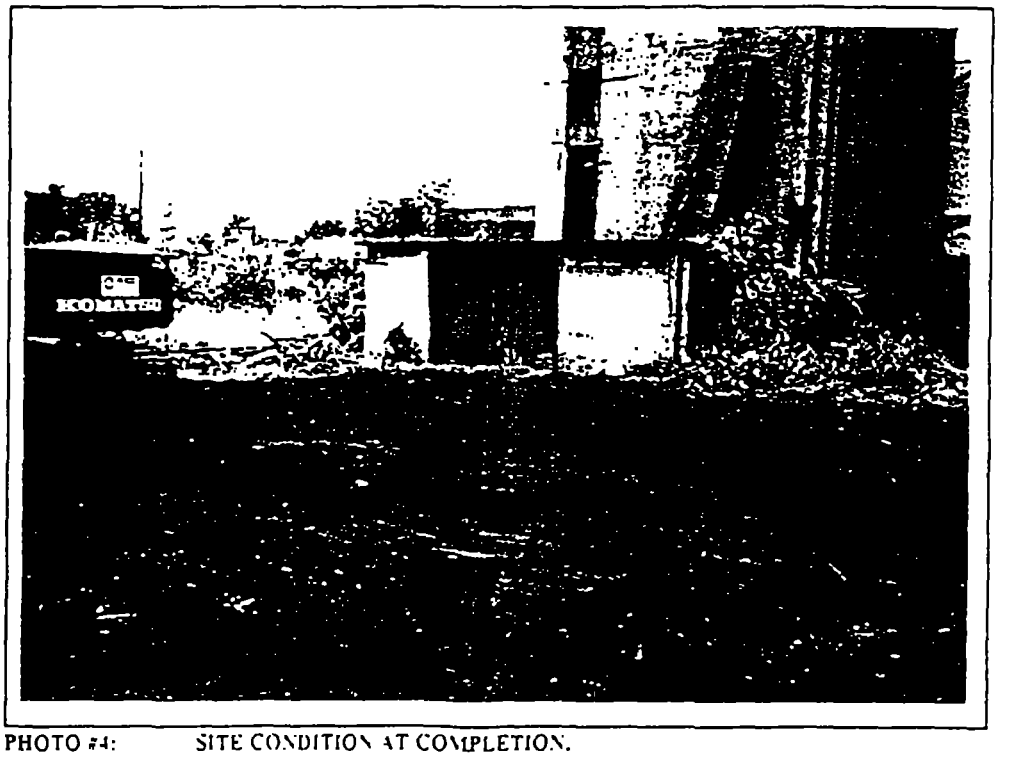


PHOTO #4: SITE CONDITION AT COMPLETION.

11.0 DESCRIPTION OF RESIDUAL CONTAMINATION

Based on odor and appearance, no contaminated media was observed during tank removal operations.

12.0 AMOUNT OF EXCAVATED SOILS

Approximately 30 cubic yards of soil was removed in efforts to remove the tank and affected soils.

13.0 SLUDGE IN TANKS

The tank had previously been emptied of all contents and cleaned. Fifteen drums of Waste Oil/ethylene glycol sludge/liquid was generated for disposal.

15.0 DISPOSAL OF TANK CONTENTS

Tank contents is currently awaiting acceptance for disposal by a licensed and permitted disposal company.

16.0 DISPOSAL OF TANK(S)

The tank was transported to, and disposed of through scrap metal recycling at Grossman Iron & Steel Company, St. Louis, MO.

17.0 FORMER CONTENTS OF TANK(S)

TRRA indicated the tank originally was used to store Fuel Oil.

18.0 DEPTH OF GROUNDWATER

After tank removal, a small amount of water was present in the tank pit area estimated at < 50 gallons. This water was absorbed into the loose soils in the pit during subsequent excavation activities. No other water accumulated or was encountered.

AMERICAN INTERPLEX CORPORATION
LABORATORIES

8600 Kanis Road
Little Rock, AR 72204-2322
(501) 224-5060

The Gehm Corporation (C-1270)
Post Office Box 65
Boonville, MO 65233

October 19, 1993

ATTN: Mr. Daryl Bowles

Control No. 4528

Sample Description: Three (3) soil received on 10/13/93
Re: Terminal Railroad Assn. 0119
P.O. No. 101-293 0119

Result:

Parameter	Unit	Pit 10-11-93 1020	DGW 10-11-93 1022	SP 10-11-93 1025
Total Recoverable Petroleum Hydrocarbons	mg/Kg	<5	<5	66
PCB	mg/Kg	<0.05	<0.05	<0.05
Benzene	mg/Kg	<0.002	<0.002	<0.002
Toluene	mg/Kg	<0.002	<0.002	<0.002
Ethylbenzene	mg/Kg	<0.002	<0.002	<0.002
m- & p-Xylenes	mg/Kg	<0.002	<0.002	<0.002
o-Xylene	mg/Kg	<0.002	<0.002	<0.002

Method: Modified EPA 418.1, EPA 3550, 8080, 5030A, 8020

Remark: Results are presented on an as-received basis.

Enclosure: Chain of Custody

AMERICAN INTERPLEX CORPORATION

By Steven Lovell
Steven Lovell
Technical Director

MWM/tj

HICL-95-28

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

THE GEHM Corporation

Submitted by: (Name/Telephone/Date)	Lab: (Name/Address/Telephone)	Client Name/Project Location: (Contact/Phone #)
THE GEHM CORPORATION 1417 BINGHAM RD, P.O. BOX 65 BOONVILLE, MO 65233 DAZYL BOWLES 816-882-3485	AMERICAN INTERPLEX CORP. 8600 KANIS RD. LITTLE ROCK, AR 72204 501-224-5060	TERMINAL RAILROAD ASSN. FIRST & MOUND STREETS ST. LOUIS, MO Bob Ropper 314-539-4712

Project No.:	Applicable Regulatory No.:	P.O. #: (For Lab)	Samplers Signature:
0119	N/A	101-293 0119	Dazyl K. Bowles

AIC #	Sample ID	Matrix	Preservative	Date	Time	ANALYSIS REQUEST: BTEX (8020)	TPH (418.1)	TPH MO MOD (418.1)	OA-1 (8OWA)	OA-2 (8OWA)	TOG (413.1)	PCB CONT. (8080)	OTHER	OTHER	OTHER
1	PIT	SOIL	ICE	10-11-93	1020	X		X				X			
2	DGW	SOIL	ICE	10-11-93	1022	X		X				X			
3	SP	SOIL	ICE	10-11-93	1025	X		X				X			

COMMENTS/SPECIAL INSTRUCTIONS:

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Dazyl K. Bowles	10-12-93	1000			
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
			Shane Hulsman	10/13/93	e 1030

Petroleum Fuel & Terminal
Foot of Mullanphy Street
St. Louis, Missouri 63102
(314) 621-0522

Reference 11

Charles Gay
Fire Inspector
Fire Prevention Bureau
1421 North Jefferson
St. Louis, Missouri 63106

Dear Mr. Gay

Per our conversation on September 8, 1993. We discovered the leak during our yearly hydro teasting of our pipe lines/hoses. When we experienced a loss of 25# lb of pressure.

We then started to isolate the most likly place and this would be in the expansion joint at the sea wall. After excavating the site we then found a small pen hole in a 6 inch pipe line. After making the necessary repairs we decided to take this pipe line out of service.

We recovered 2 1/2 bbls of oil/soil to be disposed of. If you feel the need to contact me on this mater please feel free to do so at (314) 621-0522.

Thank you

Randel H. Lewis
Terminal Manager

HE 9/22/93

Post-it™ brand fax transmittal memo 7671 [illegible] pages ▸

To Howard Edmond	From Charles Gay
Co.	Co.
Dept.	Phone #
Fax #	Fax #

Reference 12

MSD ENVIRONMENTAL COMPLIANCE LABORATORY
INSTRUMENTATION ANALYSIS

Lab. No. 270 Sample Source: Wet Well Date Received 7-9-93

Sample Date 7-8-93 Time: ☐ Grab ☐ Comp Collected by:

☒ IR ☐ GC ☐ LEL ☐ RAD ☐ UV ☐ FLUOR ☐ TLC ☐

☐ **Priority Pollutant** mg/L (except as noted)

☐ **VOLATILES:**

acrolein	
acrylonitrile	
benzene	
bromodichloromethane	
bromoform	
bromomethane	
carbon tetrachloride	
chlorobenzene	
chloroethane	
2-chloroethyl vinyl ether	
chloroform	
chloromethane	
dibromochloromethane	
1,2-dichlorobenzene	
1,3-dichlorobenzene	
1,4-dichlorobenzene	
1,1-dichloroethane	
1,2-dichloroethane	
1,1-dichloroethene	
trans-1, 2-dichloroethene	
1,2-dichloropropane	
1, 3-dichloropropene, cis	
1, 3-dichloropropene, trans	
ethyl benzene	
methylene chloride	
1,1,2,2-tetrachloroethane	
tetrachloroethene	
toluene	
1,1,1-trichloroethane	
1,1,2-trichloroethane	
trichloroethene	
vinyl chloride	

☐ **ACIDS:**

4-chloro-3-methylphenol	
2-chlorophenol	
2,4-dichlorophenol	
2,4-dimethylphenol	
4, 6-dinitro-2-methylphenol	

ACIDS: (Cont'd)

2,4-dinitrophenol	
2-nitrophenol	
4-nitrophenol	
pentachlorophenol	
phenol	
2,4,6-trichlorophenol	

☐ **BASE/NEUTRALS**

acenaphthene	
acenaphthylene	
anthracene	
benzidine	
benzo(a)anthracene	
benzo(a)pyrene	
benzo (b) fluoranthene	
benzo (g,h,i) perylene	
benzo (k) fluoranthene	
bis (2-chloroethoxy) methane	
bis (2-chloroethyl) ether	
bis (2-chloroisopropyl) ether	
bis (2-ethylhexyl) phthalate	
4-bromophenyl phenyl ether	
butyl benzyl phthalate	
2-chloronaphthalene	
4-chlorophenyl phenyl ether	
chrysene	
dibenzo (a,h) anthracene	
3,3-dichlorobenzidine	
diethyl phthalate	
dimethyl phthalate	
di-n-butyl phthalate	
di-n-octyl phthalate	
2,4-dinitrotoluene	
2,6-dinitrotoluene	
1,2-diphenylhydrazine	
fluoranthene	
fluorene	
hexachlorobenzene	
hexachlorobutadiene	

BASE/NEUTRALS: (Cont'd)

hexachlorocyclopentadiene	
hexachloroethane	
indeno (1,2,3-cd) pyrene	
isophorone	
naphthalene	
nitrobenzene	
N-nitrosodimethylamine	
N-nitrosodi-n-propylamine	
N-nitrosodiphenylamine	
phenanthrene	
pyrene	
2,3,7,8-tetrachlorodibenzo-p-dioxin	
1,2,4-trichlorobenzene	

☐ **PESTICIDES:**

aldrin	
alpha-BHC	
beta-BHC	
gamma-BHC	
delta-BHC	
chlordane	
4,4'-DDD	
4,4-DDE	
4,4-DDT	
dieldrin	
alpha-endosulfan	
beta-endosulfan	
endousulfan sulfate	
endrin	
endrin aldehyde	
heptachlor epoxide	
heptachlor	
PCB-1016	<5.0
PCB-1221	
PCB-1232	
PCB-1242	
PCB-1248	<5.0
PCB-1254	+3 = 47.0
PCB-1260	<1.0
toxaphene	

☐ Gas Chromatography results:

☐ Thin-Layer Chromatography results:

☒ Appearance: Dark oil

☒ Infrared Spectroscopy (a) methods utilized: Smear test

(b) results: 2920 cm⁻¹ – Triplet – Strong
1460 cm⁻¹ – Singlet – Moderate
1380 cm⁻¹ – Singlet – Moderate

☒ Odor: Gasoline

☐ API Gravity:

☐ Solubilities:

☐ Ultraviolet/Visible Spectroscopy results:

☐ Distillation Range:

☐ Flash Point:

☐

☒ Special Tests: (specify) Dexsil "Clor-N-Oil" PCB screening Kit 1/50 Dilution > 50ppm PC

Conclusions Infrared Spectra on Sample # 0434 and #270 are similar.

Date Transmitted: 7/19/93 by: Daniel F. Zavida

64-130WW

MSD ENVIRONMENTAL COMPLIANCE LABORATORY
INSTRUMENTATION ANALYSIS

Lab. No. 434 Sample Source: UST Brooklyn & Mound Date Received 7/15/93

Sample Date 7/14/93 Time: _____ ☒ Grab ☐ Comp Collected by: _____

☒ IR ☒ GC ☐ LEL ☐ RAD ☐ UV ☐ FLUOR ☐ TLC ☐ _____

☐ Priority Pollutant mg/L (except as noted)

☐ **VOLATILES:**

acrolein	
acrylonitrile	
benzene	
bromodichloromethane	
bromoform	
bromomethane	
carbon tetrachloride	
chlorobenzene	
chloroethane	
2-chloroethyl vinyl ether	
chloroform	
chloromethane	
dibromochloromethane	
1,2-dichlorobenzene	
1,3-dichlorobenzene	
1,4-dichlorobenzene	
1,1-dichloroethane	
1,2-dichloroethane	
1,1-dichloroethene	
trans-1, 2-dichloroethene	
1,2-dichloropropane	
1, 3-dichloropropene, cis	
1, 3-dichloropropene, trans	
ethyl benzene	
methylene chloride	
1,1,2,2-tetrachloroethane	
tetrachloroethene	
toluene	
1,1,1-trichloroethane	
1,1,2-trichloroethane	
trichloroethene	
vinyl chloride	

☐ **ACIDS:**

4-chloro-3-methylphenol	
2-chlorophenol	
2,4-dichlorophenol	
2,4-dimethylphenol	
4, 6-dinitro-2-methylphenol	

ACIDS: (Cont'd)

2,4-dinitrophenol	
2-nitrophenol	
4-nitrophenol	
pentachlorophenol	
phenol	
2,4,6-trichlorophenol	

☐ **BASE/NEUTRALS**

acenaphthene	
acenaphthylene	
anthracene	
benzidine	
benzo(a)anthracene	
benzo(a)pyrene	
benzo (b) fluoranthene	
benzo (g,h,i) perylene	
benzo (k) fluoranthene	
bis (2-chloroethoxy) methane	
bis (2-chloroethyl) ether	
bis (2-chloroisopropyl) ether	
bis (2-ethylhexyl) phthalate	
4-bromophenyl phenyl ether	
butyl benzyl phthalate	
2-chloronaphthalene	
4-chlorophenyl phenyl ether	
chrysene	
dibenzo (a,h) anthracene	
3,3-dichlorobenzidine	
diethyl phthalate	
dimethyl phthalate	
di-n-butyl phthalate	
di-n-octyl phthalate	
2,4-dinitrotoluene	
2,6-dinitrotoluene	
1,2-diphenylhydrazine	
fluoranthene	
fluorene	
hexachlorobenzene	
hexachlorobutadiene	

BASE/NEUTRALS: (Cont'd)

hexachlorocyclopentadiene	
hexachloroethane	
indeno (1,2,3-cd) pyrene	
isophorone	
naphthalene	
nitrobenzene	
N-nitrosodimethylamine	
N-nitrosodi-n-propylamine	
N-nitrosodiphenylamine	
phenanthrene	
pyrene	
2,3,7,8-tetrachlorodibenzo-p-dioxin	
1,2,4-trichlorobenzene	

☐ **PESTICIDES:**

aldrin	
alpha-BHC	
beta-BHC	
gamma-BHC	
delta-BHC	
chlordane	
4,4'-DDD	
4,4-DDE	
4,4-DDT	
dieldrin	
alpha-endosulfan	
beta-endosulfan	
endousulfan sulfate	
endrin	
endrin aldehyde	
heptachlor epoxide	
heptachlor	
PCB-1016	<1.0
PCB-1221	<1.0
PCB-1232	<1.0
PCB-1242	<1.0
PCB-1248	<1.0
PCB-1254	39.0
PCB-1260	<1.0
toxaphene	

☐ Gas Chromatography results: _____

☐ Thin-Layer Chromatography results: _____

☒ Appearance: Dark oil

☒ Infrared Spectroscopy (a) methods utilized: Smear test

(b) results: 2920 – Strong – Triplet
1460 – Moderate – Triplet
1380 – Moderate – Triplet

☒ Odor: Gasoline & oil

☐ API Gravity: _____

☐ Solubilities: _____

☐ Ultraviolet/Visible Spectroscopy results: _____

☐ Distillation Range: _____

☐ Flash Point: _____

☐ _____

☐ Special Tests: (specify)

Conclusions Infrared spectra on Samples #434 and #270 are similar.

Date Transmitted: 7/19/93 by: Daniel F Jenida

Reference 13

MSD ENVIRONMENTAL COMPLIANCE LABORATORY
SPECIAL SAMPLE FORM

Lab. No. 886 ☐ Comp ☒ Grab Date Received 8/9/93

Sample Date 8/9/93 Sample Time 0845 to

Requested by: HEDMOND Collected by: SAME

Sample Source: MH # MH 12 F-6A1 Truck No.

Sampling Location: NEXT TO FLOOD WALL & MULCAHY

Reason for sample: TO DETERMINE IF PCB's PRESENT

☐ Trunk ☐ Sanitary ☐ Stream ☐ Storm ☐ Seepage ☐ STP ☐ Hauler

☐ Industry ☐ Other (explain)

Analysis: except as noted ☐ mg/L ☐ ug/L ☐ mg/kg ☐ % comp ☐ other

☐ pH	(units)	☐ F		☐ Hg	
☐ SPC	(umhos/cm)	☐ Cl		☐ As	
☐ ALK		☐ CN		☐ Ba	
☐ ACI		☐ CNA		☐ Be	
☐ TS		☐ KJN		☐ Cd	
☐ SS		☐ NH_3		☐ Cr	
☐ VSS		☐ NO_3		☐ Cu	
☐ %V		☐ NO_2		☐ Fe	
☐ SET	(ml/L)	☐ PHT		☐ Pb	
☐ GRE		☐ PHO		☐ Ni	
☐ BOD		☐ SO_4		☐ Se	
☐ COD		☐ SO_3		☐ Ag	
☐ TOC		☐ S		☐ Zn	
☐ PHE		☐ SUR		☐ Tl	
☐		☐		☐ Sb	
☐		☐		☐	
☐		☐		☐	
☐ Color:		☐ Cr^{+6}		☐	

☐ Odor: ☐ Tot. Hardness

☐ Appearance: ☐ Tot. Chlorine

☐ Organics ☐ IR ☐ GC ☐ LEL ☐ RAD ☐ UV ☐ FLUOR ☒ ID

☐ Biological: ☐ Bioassay: ☐ Total Coli: No./100ml

☐ Fecal Coli: No./100ml

☐ Microscopic: ☐ FecalStrep: No./100ml

Remarks: CHECK FOR PCB'S

Date Transmitted: 8/17/93 by: MARIO J. DRAIM

75 - DEC/LAB

MSD ENVIRONMENTAL COMPLIANCE LABORATORY
INSTRUMENTATION ANALYSIS

Lab. No. 886 Sample Source: Manhole F-6A1 (#12) Date Received 8/9/93

Sample Date 8/9/93 Time: 0845 ☒ Grab ☐ Comp Collected by: _____

☒ IR ☒ GC ☐ LEL ☐ RAD ☐ UV ☐ FLUOR ☐ TLC ☐ _____

☐ **Priority Pollutant** _____ mg/L (except as noted)

☐ **VOLATILES:**

	acrolein	
	acrylonitrile	
X	benzene	21.0
	bromodichloromethane	
	bromoform	
	bromomethane	
	carbon tetrachloride	
	chlorobenzene	
	chloroethane	
	2-chloroethyl vinyl ether	
	chloroform	
	chloromethane	
	dibromochloromethane	
	1,2-dichlorobenzene	
	1,3-dichlorobenzene	
	1,4-dichlorobenzene	
	1,1-dichloroethane	
	1,2-dichloroethane	
	1,1-dichloroethene	
	trans-1, 2-dichloroethene	
	1,2-dichloropropane	
	1, 3-dichloropropene, cis	
	1, 3-dichloropropene, trans	
X	ethyl benzene	32.0
	methylene chloride	
	1,1,2,2-tetrachloroethane	
	tetrachloroethene	
X	toluene	<1.0
	1,1,1-trichloroethane	
	1,1,2-trichloroethane	
	trichloroethene	
	vinyl chloride	

☐ **ACIDS:**

	4-chloro-3-methylphenol	
	2-chlorophenol	
	2,4-dichlorophenol	
	2,4-dimethylphenol	
	4, 6-dinitro-2-methylphenol	

ACIDS: (Cont'd)

	2,4-dinitrophenol	
	2-nitrophenol	
	4-nitrophenol	
	pentachlorophenol	
	phenol	
	2,4,6-trichlorophenol	

☐ **BASE/NEUTRALS**

	acenaphthene	
	acenaphthylene	
	anthracene	
	benzidine	
	benzo(a)anthracene	
	benzo(a)pyrene	
	benzo (b) fluoranthene	
	benzo (g,h,i) perylene	
	benzo (k) fluoranthene	
	bis (2-chloroethoxy) methane	
	bis (2-chloroethyl) ether	
	bis (2-chloroisopropyl) ether	
	bis (2-ethylhexyl) phthalate	
	4-bromophenyl phenyl ether	
	butyl benzyl phthalate	
	2-chloronaphthalene	
	4-chlorophenyl phenyl ether	
	chrysene	
	dibenzo (a,h) anthracene	
	3,3-dichlorobenzidine	
	diethyl phthalate	
	dimethyl phthalate	
	di-n-butyl phthalate	
	di-n-octyl phthalate	
	2,4-dinitrotoluene	
	2,6-dinitrotoluene	
	1,2-diphenylhydrazine	
	fluoranthene	
	fluorene	
	hexachlorobenzene	
	hexachlorobutadiene	

BASE/NEUTRALS: (Cont'd)

	hexachlorocyclopentadiene	
	hexachloroethane	
	indeno (1,2,3-cd) pyrene	
	isophorone	
	naphthalene	
	nitrobenzene	
	N-nitrosodimethylamine	
	N-nitrosodi-n-propylamine	
	N-nitrosodiphenylamine	
	phenanthrene	
	pyrene	
	2,3,7,8-tetrachlorodibenzo-p-dioxin	
	1,2,4-trichlorobenzene	

☐ **PESTICIDES:**

	aldrin	
	alpha-BHC	
	beta-BHC	
	gamma-BHC	
	delta-BHC	
	chlordane	
	4,4'-DDD	
	4,4-DDE	
	4,4-DDT	
	dieldrin	
	alpha-endosulfan	
	beta-endosulfan	
	endosulfan sulfate	
	endrin	
	endrin aldehyde	
	heptachlor epoxide	
	heptachlor	
X	PCB-1016	<1.0
X	PCB-1221	↓
X	PCB-1232	↓
X	PCB-1242	↓
X	PCB-1248	<1.0
X	PCB-1254	75.4
X	PCB-1260	<1.0
	toxaphene	

☐ Gas Chromatography results: Run Method 203 on Volatiles

GC/FID resemble Diesel Fuel

☐ Thin-Layer Chromatography results: _____

☐ Appearance: _____

☒ Infrared Spectroscopy (a) methods utilized: Smear test

(b) results: 2920 cm⁻¹ - Triplet - Strong
1460 cm⁻¹ - Singlet - Moderate
1380 cm⁻¹ - Singlet - Moderate
1590 cm⁻¹ - Singlet - Moderate

☐ Odor: _____

☐ API Gravity: _____

☐ Solubilities: _____

☐ Ultraviolet/Visible Spectroscopy results: _____

☐ Distillation Range: _____

☐ Flash Point: _____

☐ _____

☐ Special Tests: (specify)

Conclusions Both Infrared spectra and GC/FID resemble Diesel Fuels

Date Transmitted: 8/13/93 by: Daniel Flenida

MSD ENVIRONMENTAL COMPLIANCE LABORATORY
SPECIAL SAMPLE FORM

Lab. No. 887 ☐ Comp ☒ Grab Date Received 8/9/93

Sample Date 8/9/93 Sample Time: 0835 to

Requested by: HEDMOND Collected by: SAME

Truck No.

Sample Source: MH # MH013 F-641

Sampling Location: NEXT TO FLOOD WALL AT MULLANPHY

Reason for sample: TO DETERMINE IF PCB'S PRESENT

☐ Trunk ☐ Sanitary ☐ Stream ☐ Storm ☐ Seepage ☐ STP ☐ Hauler

☐ Industry ☐ Other (explain)

Analysis: except as noted ☐ mg/L ☐ ug/L ☐ mg/kg ☐ % comp ☐ other

☐ pH	(units)	☐ F		☐ Hg	
☐ SPC	(umhos/cm)	☐ Cl		☐ As	
☐ ALK		☐ CN		☐ Ba	
☐ ACI		☐ CNA		☐ Be	
☐ TS		☐ KJN		☐ Cd	
☐ SS		☐ NH_3		☐ Cr	
☐ VSS		☐ NO_3		☐ Cu	
☐ %V		☐ NO_2		☐ Fe	
☐ SET	(ml/L)	☐ PHT		☐ Pb	
☐ GRE		☐ PHO		☐ Ni	
☐ BOD		☐ SO_4		☐ Se	
☐ COD		☐ SO_3		☐ Ag	
☐ TOC		☐ S		☐ Zn	
☐ PHE		☐ SUR		☐ Tl	
☐		☐		☐ Sb	
☐		☐		☐	
☐		☐		☐	
☐ Color:		☐ Cr^{+6}		☐	

☐ Odor: ☐ Tot. Hardness

☐ Appearance: ☐ Tot. Chlorine

☐ Organics ☐ IR ☐ GC ☐ LEL ☐ RAD ☐ UV ☐ FLUOR ☒ ID

☐ Biological: ☐ Bioassay:

☐ Microscopic:

☐ Total Coli: No./100ml

☐ Fecal Coli: No./100ml

☐ FecalStrep: No./100ml

Remarks: CHECK FOR PCB'S

Date Transmitted: 8/17/93 by: MARIO J. DARRIN

75 - DEC/LAB

MSD ENVIRONMENTAL COMPLIANCE LABORATORY
INSTRUMENTATION ANALYSIS

Lab. No. 887 Sample Source: Manhole F-6A1 (#13) Date Received 8/9/93

Sample Date 8/9/93 Time: 0835 ☒ Grab ☐ Comp Collected by: _____

☒ IR ☒ GC ☐ LEL ☐ RAD ☐ UV ☐ FLUOR ☐ TLC ☐ _____

☐ **Priority Pollutant** mg/L (except as noted)

☐ **VOLATILES:**

	acrolein	
	acrylonitrile	
X	benzene	21.0
	bromodichloromethane	
	bromoform	
	bromomethane	
	carbon tetrachloride	
	chlorobenzene	
	chloroethane	
	2-chloroethyl vinyl ether	
	chloroform	
	chloromethane	
	dibromochloromethane	
	1,2-dichlorobenzene	
	1,3-dichlorobenzene	
	1,4-dichlorobenzene	
	1,1-dichloroethane	
	1,2-dichloroethane	
	1,1-dichloroethene	
	trans-1, 2-dichloroethene	
	1,2-dichloropropane	
	1, 3-dichloropropene, cis	
	1, 3-dichloropropene, trans	
X	ethyl benzene	21.0
	methylene chloride	
	1,1,2,2-tetrachloroethane	
	tetrachloroethene	
X	toluene	< 1.0
	1,1,1-trichloroethane	
	1,1,2-trichloroethane	
	trichloroethene	
	vinyl chloride	

☐ **ACIDS:**

	4-chloro-3-methylphenol	
	2-chlorophenol	
	2,4-dichlorophenol	
	2,4-dimethylphenol	
	4, 6-dinitro-2-methylphenol	

ACIDS: (Cont'd)

	2,4-dinitrophenol	
	2-nitrophenol	
	4-nitrophenol	
	pentachlorophenol	
	phenol	
	2,4,6-trichlorophenol	

☐ **BASE/NEUTRALS**

	acenaphthene	
	acenaphthylene	
	anthracene	
	benzidine	
	benzo(a)anthracene	
	benzo(a)pyrene	
	benzo (b) fluoranthene	
	benzo (g,h,i) perylene	
	benzo (k) fluoranthene	
	bis (2-chloroethoxy) methane	
	bis (2-chloroethyl) ether	
	bis (2-chloroisopropyl) ether	
	bis (2-ethylhexyl) phthalate	
	4-bromophenyl phenyl ether	
	butyl benzyl phthalate	
	2-chloronaphthalene	
	4-chlorophenyl phenyl ether	
	chrysene	
	dibenzo (a,h) anthracene	
	3,3-dichlorobenzidine	
	diethyl phthalate	
	dimethyl phthalate	
	di-n-butyl phthalate	
	di-n-octyl phthalate	
	2,4-dinitrotoluene	
	2,6-dinitrotoluene	
	1,2-diphenylhydrazine	
	fluoranthene	
	fluorene	
	hexachlorobenzene	
	hexachlorobutadiene	

BASE/NEUTRALS: (Cont'd)

	hexachlorocyclopentadiene	
	hexachloroethane	
	indeno (1,2,3-cd) pyrene	
	isophorone	
	naphthalene	
	nitrobenzene	
	N-nitrosodimethylamine	
	N-nitrosodi-n-propylamine	
	N-nitrosodiphenylamine	
	phenanthrene	
	pyrene	
	2,3,7,8-tetrachlorodibenzo-p-dioxin	
	1,2,4-trichlorobenzene	

☐ **PESTICIDES:**

	aldrin	
	alpha-BHC	
	beta-BHC	
	gamma-BHC	
	delta-BHC	
	chlordane	
	4,4'-DDD	
	4,4-DDE	
	4,4-DDT	
	dieldrin	
	alpha-endosulfan	
	beta-endosulfan	
	endousulfan sulfate	
	endrin	
	endrin aldehyde	
	heptachlor epoxide	
	heptachlor	
X	PCB-1016	< 1.0
X	PCB-1221	
X	PCB-1232	
X	PCB-1242	
X	PCB-1248	< 1.0
X	PCB-1254	11.7
X	PCB-1260	< 1.0
	toxaphene	

☐ Gas Chromatography results: Run Method 203 on Volatiles

GC/FID resembles Diesel Fuel

☐ Thin-Layer Chromatography results: _____

☐ Appearance: _____

☒ Infrared Spectroscopy (a) methods utilized: Smear test

(b) results: 2926 cm⁻¹ - Strong - Triplet
1466 cm⁻¹ - Moderate - Singlet
1378 cm⁻¹ - Moderate - Singlet
1596 cm⁻¹ - Moderate - Singlet

☐ Odor: _____

☐ API Gravity: _____

☐ Solubilities: _____

☐ Ultraviolet/Visible Spectroscopy results: _____

☐ Distillation Range: _____

☐ Flash Point: _____

☐ _____

☐ Special Tests: (specify)

Conclusions Infrared spectra and GC/FID resemble Diesel Fuel

Date Transmitted: 8/13/93 by: Daniel Florida

MSD ENVIRONMENTAL COMPLIANCE LABORATORY
SPECIAL SAMPLE FORM

Lab No: 888 ☐ Comp ☒ Grab Date Received 8/9/93

Sample Date 8/9/93 Sample Time: 0825 to

Requested by: REDMOND Collected by: SAME

Truck No.

Sample Source: MH F MH 14 F-6A1

Sampling Location: NEXT TO FLUID WALL AT MULLANPHY

Reason for sample: TO DETERMINE IF PCB'S PRESENT

☐ Trunk ☐ Sanitary ☐ Stream ☐ Storm ☐ Seepage ☐ STP ☐ Hauler

☐ Industry ☐ Other (explain)

Analysis: except as noted ☐ mg/L ☐ ug/L ☐ mg/kg ☐ % comp ☐ other

☐ pH	(units)	☐ F		☐ Hg	
☐ SPC	(umhos/cm)	☐ Cl		☐ As	
☐ ALK		☐ CN		☐ Ba	
☐ ACI		☐ CNA		☐ Be	
☐ TS		☐ KJN		☐ Cd	
☐ SS		☐ NH_3		☐ Cr	
☐ VSS		☐ NO_3		☐ Cu	
☐ %V		☐ NO_2		☐ Fe	
☐ SET	(ml/L)	☐ PHT		☐ Pb	
☐ GRE		☐ PHO		☐ Ni	
☐ BOD		☐ SO_4		☐ Se	
☐ COD		☐ SO_3		☐ Ag	
☐ TOC		☐ S		☐ Zn	
☐ PHE		☐ SUR		☐ Tl	
☐		☐		☐ Sb	
☐		☐		☐	
☐		☐		☐	
☐ Color:		☐ Cr^{+6}		☐	

☐ Odor: ☐ Tot. Hardness

☐ Appearance: ☐ Tot. Chlorine

☐ Organics ☐ IR ☐ GC ☐ LEL ☐ RAD ☐ UV ☐ FLUOR ☒ ID

☐ Biological: ☐ Bioassay:

☐ Microscopic:

☐ Total Coli: No./100ml

☐ Fecal Coli: No./100ml

☐ FecalStrep: No./100ml

Remarks: CHECK FOR PCB'S

Date Transmitted: 8/17/93 by: MARIO J. DEPRIMO

75 - DEC/LAB

MSD ENVIRONMENTAL COMPLIANCE LABORATORY
INSTRUMENTATION ANALYSIS

Lab. No. 888 Sample Source: Manhole F-6A1 (#14) Date Received 8/9/93

Sample Date 8/9/93 Time: 0825 ☒ Grab ☐ Comp Collected by:

☒ IR ☒ GC ☐ LEL ☐ RAD ☐ UV ☐ FLUOR ☐ TLC ☐

☐ **Priority Pollutant** mg/L (except as noted)

☐ **VOLATILES:**

	acrolein	
	acrylonitrile	
X	benzene	21.0
	bromodichloromethane	
	bromoform	
	bromomethane	
	carbon tetrachloride	
	chlorobenzene	
	chloroethane	
	2-chloroethyl vinyl ether	
	chloroform	
	chloromethane	
	dibromochloromethane	
	1,2-dichlorobenzene	
	1,3-dichlorobenzene	
	1,4-dichlorobenzene	
	1,1-dichloroethane	
	1,2-dichloroethane	
	1,1-dichloroethene	
	trans-1, 2-dichloroethene	
	1,2-dichloropropane	
	1, 3-dichloropropene, cis	
	1, 3-dichloropropene, trans	
X	ethyl benzene	21.0
	methylene chloride	
	1,1,2,2-tetrachloroethane	
	tetrachloroethene	
X	toluene	21.
	1,1,1-trichloroethane	
	1,1,2-trichloroethane	
	trichloroethene	
	vinyl chloride	

☐ **ACIDS:**

	4-chloro-3-methylphenol	
	2-chlorophenol	
	2,4-dichlorophenol	
	2,4-dimethylphenol	
	4, 6-dinitro-2-methylphenol	

ACIDS: (Cont'd)

	2,4-dinitrophenol	
	2-nitrophenol	
	4-nitrophenol	
	pentachlorophenol	
	phenol	
	2,4,6-trichlorophenol	

☐ **BASE/NEUTRALS**

	acenaphthene	
	acenaphthylene	
	anthracene	
	benzidine	
	benzo(a)anthracene	
	benzo(a)pyrene	
	benzo (b) fluoranthene	
	benzo (g,h,i) perylene	
	benzo (k) fluoranthene	
	bis (2-chloroethoxy) methane	
	bis (2-chloroethyl) ether	
	bis (2-chloroisopropyl) ether	
	bis (2-ethylhexyl) phthalate	
	4-bromophenyl phenyl ether	
	butyl benzyl phthalate	
	2-chloronaphthalene	
	4-chlorophenyl phenyl ether	
	chrysene	
	dibenzo (a,h) anthracene	
	3,3-dichlorobenzidine	
	diethyl phthalate	
	dimethyl phthalate	
	di-n-butyl phthalate	
	di-n-octyl phthalate	
	2,4-dinitrotoluene	
	2,6-dinitrotoluene	
	1,2-diphenylhydrazine	
	fluoranthene	
	fluorene	
	hexachlorobenzene	
	hexachlorobutadiene	

BASE/NEUTRALS: (Cont'd)

	hexachlorocyclopentadiene	
	hexachloroethane	
	indeno (1,2,3-cd) pyrene	
	isophorone	
	naphthalene	
	nitrobenzene	
	N-nitrosodimethylamine	
	N-nitrosodi-n-propylamine	
	N-nitrosodiphenylamine	
	phenanthrene	
	pyrene	
	2,3,7,8-tetrachlorodibenzo-p-dioxin	
	1,2,4-trichlorobenzene	

☐ **PESTICIDES:**

	aldrin	
	alpha-BHC	
	beta-BHC	
	gamma-BHC	
	delta-BHC	
	chlordane	
	4,4'-DDD	
	4,4-DDE	
	4,4-DDT	
	dieldrin	
	alpha-endosulfan	
	beta-endosulfan	
	endousulfan sulfate	
	endrin	
	endrin aldehyde	
	heptachlor epoxide	
	heptachlor	
X	PCB-1016	<1.0
X	PCB-1221	↓
X	PCB-1232	↓
X	PCB-1242	↓
X	PCB-1248	<1.0
X	PCB-1254	36.6
X	PCB-1260	<1.0
	toxaphene	

☐ Gas Chromatography results: Run Method 203 on Volatiles

GC/FID resembles Diesel Fuel

☐ Thin-Layer Chromatography results:

☐ Appearance:

☒ Infrared Spectroscopy (a) methods utilized: Smear test

(b) results: 2920 cm⁻¹ - Strong - Triplet
1460 cm⁻¹ - Moderate - Singlet
1350 cm⁻¹ - Moderate - Singlet
1000 cm⁻¹ - Moderate - Singlet

☐ Odor:

☐ API Gravity:

☐ Solubilities:

☐ Ultraviolet/Visible Spectroscopy results:

☐ Distillation Range:

☐ Flash Point:

☐

☐ Special Tests: (specify)

Conclusions Infrared spectra and GC/FID resemble Diesel Fuel.

Date Transmitted: 8/13/93 by: Daniel Flanda

Reference 15

PRELIMINARY ASSESSMENT

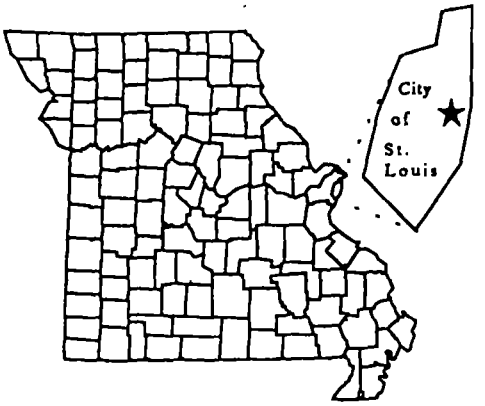
MOUND STREET PCB'S

CITY OF ST. LOUIS, MISSOURI

March 21, 1994

Missouri Department of Natural Resources

Hazardous Waste Program



Prepared By	Reviewed By	Approved By
Don Falls	James L. Kavanaugh	Edwin Knight
Environmental Specialist	Chief, Site Evaluation Unit	Chief Superfund Section

Reference 16

Rules of
Department of Natural Resources
Division 20—Clean Water Commission
Chapter 7—Water Quality

DEPARTMENT OF NATURAL RESOURCES
Division of Environmental Quality
Hazardous Waste Program

TELEPHONE OR CONFERENCE RECORD

File: Mound Street PCB Site

Date: December 29, 1993

TELEPHONE

Incoming (X)
Outgoing ( )

CONFERENCE

Field ( )
Office (X)

SUBJECT: Mound Street PCB Site, Drinking Water Intakes

PERSONS INVOLVED

Name	Representing
Eddie Starbuck	MDNR, Geology and Land Survey
Don Falls	MDNR, Hazardous Waste Program
Sally McConkey	Illinois Water Survey
Richard Reed	Illinois American Water Company

SUMMARY OF CONVERSATION:

Eddie Starbuck phoned to let me know that she had reviewed her notes from her previous work on the St. Louis Ship site and discovered a note that indicates that there is a drinking water intake located downstream of the Mound Street PCB site (approximately one mile) on the Illinois side of the Mississippi River. Her notes give the location of this intake as the SE 1/4 of the SW 1/4 of Section 11, T2N, R10W.

Eddie said she obtained this information from the Illinois Water Survey approximately two years ago and that their phone numbers are (217) 333-7223 and 333-5482.

ACTION TAKEN

I phoned the Illinois Water Survey and spoke with Ms. Sally McConkey. Ms. McConkey referred me to the Illinois American Water Company at (618) 874-1873. I then phoned Illinois American Water Company and spoke with a Mr. Richard Reed, Assistant Production Supervisor. Mr. Reed informed me that the Illinois American Water Company utilizes two water intake locations, one at Chouteau Island, which is about 10 miles upstream from the Mound Street site, and the intake in Section 11 in East St. Louis, Illinois. Mr. Reed said that their water company serves 19 medium to small communities with a combined service population of approximately 300,000. He also said that the East St. Louis intake has a

production capacity of 30 million gallons a day and is blended with water from the Chouteau Island intake. The East St. Louis intake provides approximately 60% of the total according to Mr. Reed.

FINAL RESULTS:

This information will be incorporated into the Mound Street PCB Preliminary Assessment.

Don Falls

Don Falls
Environmental Specialist

DF:so

DEPARTMENT OF NATURAL RESOURCES
Division of Environmental Quality
Hazardous Waste Program

Reference 18

TELEPHONE OR CONFERENCE RECORD

File: Mound Street PCBs

Date: March 15, 1994

TELEPHONE (314) 882-9880

Incoming ( )
Outgoing (X)

CONFERENCE

Field ( )
Office (X)

SUBJECT: Fish Consumption From the Mississippi River at St. Louis

PERSONS INVOLVED

Name	Representing
Jack Robinson	Missouri Department of Conservation
Don Falls	MDNR, Hazardous Waste Program

SUMMARY OF CONVERSATION:

I contacted the Missouri Department of Conservation (MDOC) office in Columbia to see if their department has any records concerning annual fish consumption from the Mississippi River at St. Louis. I was referred to Mr. Jack Robinson, a fisheries biologist with the MDOC who is responsible for records of commercial fish harvest on the Missouri, Meramec, and Mississippi Rivers.

Mr. Robinson explained that MDOC did not have information on actual consumption of fish, but only on the numbers caught by commercial fishermen. This information also does not include the numbers of fish taken and eaten by sports fishers.

Mr. Robinson said that he would send me the information on annual harvest from the Mississippi River later in the week. Mr. Robinson suggested that the Missouri Department of Health might have figures on the actual amount of fish consumed because of their previous studies on Chlordane and fish.

FINAL RESULTS:

This information will be included in the Mound Street PCBs Preliminary Assessment.

Don Falls

Don Falls
Environmental Specialist
Hazardous Waste Program

CHECK OF DATA

P.2

RIVER= TOTAL COUNTY=TOTAL

SPECIE	SEINE POUNDS	SEINE DOLLARS	TRAMMEL NET POUNDS	TRAMMEL NET DOLLARS	GILL NET POUNDS	GILL NET DOLLARS	HOOP NET POUNDS	HOOP NET DOLLARS	TROT LINE POUNDS	TROT LINE DOLLARS	TOTAL POUNDS	TOTAL DOLLARS
ASIATIC CARP	.	.	6065	728	69	8	1510	181	.	.	7642	917
GRASSCARP	.	.	10762	2260	947	199	5770	1212	20	4	17499	3675
PADDLEFISH	.	.	2612	784	1361	408	1144	343	50	15	5167	1550
EEL	.	.	.	.	.	.	104	19	127	41	331	60
GAR	.	.	4083	408	60	6	3171	317	913	91	8227	823
R S CARP	.	.	26708	5075	165	28	60165	11431	.	.	87016	16533
SUCKER	.	.	4059	365	550	49	11577	1042	.	.	16186	1457
STURGEON	.	.	4468	1117	1353	338	11150	2788	30	8	17001	4250
BOWFIN	.	.	820	57	.	.	10	1	.	.	830	58
BLUE CAT	.	.	10598	5829	6415	3528	12617	6939	10848	5966	40478	22263
CHANNEL CAT	.	.	7188	3953	578	208	90990	50044	20036	11020	118592	65226
BULLHEAD	.	.	31	7	52	12	502	120	400	96	985	236
FLATHEAD	.	.	4466	2412	1522	822	69536	37549	2905	1569	78429	42352
DRUM	.	.	8919	1338	1412	212	37823	5673	2188	328	50342	7551
CARP	.	.	66367	7964	2727	327	75146	9018	512	61	144752	17370
BUFFALO	.	.	87332	20960	12841	3082	95506	22873	3069	737	198548	47652
TOTAL	.	.	244476	53257	29832	9228	476519	149551	41198	19936	792025	231972
DAYS			2938		480		105907		5930			

Total reported harvest from the Missouri, Mississippi, & St Francis Rivers in 1992

MAR 21 '94 15:27

1992

CHECK OF DATA

Total harvest reported from the Mississippi River

RIVER= MISSISSIPPI COUNTY=TOTAL

SPECIE	SEINE POUNDS	SEINE DOLLARS	TRAMMEL NET POUNDS	TRAMMEL NET DOLLARS	GILL NET POUNDS	GILL NET DOLLARS	HOOP NET POUNDS	HOOP NET DOLLARS	TROT LINE POUNDS	TROT LINE DOLLARS	TOTAL POUNDS	TOTAL DOLLARS
ASIATIC CARP	.	.	2372	285	69	8	930	112	.	.	3371	405
BIGHEAD CARP	.	.	6413	1347	437	92	2813	591	.	.	9663	2029
PADDLEFISH	.	.	2512	754	1361	408	902	271	50	15	4825	1447
EEL	.	.	.	.	.	.	98	18	227	41	325	58
GAR	.	.	2590	259	10	1	1440	144	904	90	4944	494
GRASS CARP	.	.	14788	2810	145	28	49226	9353	.	.	64159	12190
SUCKER	.	.	2109	190	510	46	10671	960	.	.	13290	1196
STURGEON	.	.	3024	756	1353	338	7643	1911	30	8	12050	3013
BONFIN	.	.	820	57	.	.	10	1	.	.	830	58
BLUE CAT	.	.	4465	2456	6040	3322	6832	3758	8875	4881	26212	14417
CHANNEL CAT	.	.	5078	2793	378	208	72575	39916	18406	10123	96437	53040
BULLHEAD	.	.	30	7	52	12	270	65	400	96	752	180
FLATHEAD	.	.	2616	1413	1522	822	47919	25876	2325	1255	54382	29366
DRUM	.	.	5191	779	1330	199	29340	4401	2110	316	37971	5696
CARP	.	.	30209	3625	832	100	36154	4338	450	54	67645	8117
BUFFALO	.	.	37791	9070	11256	2701	66274	15906	3007	722	118328	28399
TOTAL	.	.	120008	26599	25295	8286	333097	107619	36704	17602	515184	160107
DAYS			1571		407		58430		4961			

RIVER= MISSISSIPPI COUNTY=HURON S

SPECIE	SEINE POUNDS	SEINE DOLLARS	TRAMMEL NET POUNDS	TRAMMEL NET DOLLARS	GILL NET POUNDS	GILL NET DOLLARS	HOOP NET POUNDS	HOOP NET DOLLARS	TROT LINE POUNDS	TROT LINE DOLLARS	TOTAL POUNDS	TOTAL DOLLARS
BLUE CAT	.	.	.	.	.	.	.	.	414	228	414	228
CHANNEL CAT	.	.	.	.	.	.	201	111	492	270	693	381
BULLHEAD	.	.	.	.	.	.	109	26	.	.	109	26
FLATHEAD	.	.	.	.	.	.	77	52	51	17	128	69
DRUM	.	.	.	.	.	.	217	23	10	1	227	34
CARP	.	.	.	.	.	.	100	12	.	.	100	12
BUFFALO	.	.	.	.	.	.	561	135	.	.	561	135
TOTAL	.	.	.	.	.	.	1265	368	967	517	2232	885
DAYS							526		108			

RIVER= MISSISSIPPI COUNTY=BOONE 11

SPECIE	SEINE POUNDS	SEINE DOLLARS	TRAMMEL NET POUNDS	TRAMMEL NET DOLLARS	GILL NET POUNDS	GILL NET DOLLARS	HOOP NET POUNDS	HOOP NET DOLLARS	TROT LINE POUNDS	TROT LINE DOLLARS	TOTAL POUNDS	TOTAL DOLLARS
GRASSCARP	.	.	70	15	.	.	350	73	.	.	420	88
PADDLEFISH	.	.	300	90	300	90	15	4	.	.	615	184
BIG S CARP	.	.	150	28	20	4	.	.	.	.	170	32
STURGEON	.	.	100	25	.	.	.	.	.	.	100	25
BONFIN	.	.	20	1	.	.	.	.	.	.	20	1
BLUE CAT	.	.	40	22	.	.	225	124	.	.	265	146
CHANNEL CAT	.	.	160	88	.	.	560	308	.	.	720	396
FLATHEAD	.	.	300	162	.	.	256	138	.	.	556	300
DRUM	.	.	.	.	.	.	568	85	.	.	568	85

CHECK OF DATA

CHANNEL CAT	.	.	375	206	.	.	587	323	2221	1222	3183	1751
FLATHEAD	.	.	106	57	.	.	764	413	70	38	940	508
DRUM	.	.	84	13	.	.	185	28	243	36	512	77
CARP	.	.	705	85	.	.	99	12	20	2	824	99
BUFFALO	.	.	1259	302	.	.	2036	489	.	.	3295	791
TOTAL	.	.	3169	898	.	.	3711	1276	2634	1335	9524	3509
DAYS				24				4174		707		

RIVER= MISSISSIPPI COUNTY=ST GENEVIEVE 96

SPECIE	SEINE POUNDS	SEINE DOLLARS	TRAMMEL NET POUNDS	TRAMMEL NET DOLLARS	GILL NET POUNDS	GILL NET DOLLARS	HOOP NET POUNDS	HOOP NET DOLLARS	TROT LINE POUNDS	TROT LINE DOLLARS	TOTAL POUNDS	TOTAL DOLLARS
GAR	.	.	.	.	.	.	.	.	100	10	100	10
Q S CARP	.	.	12	2	.	.	70	13	.	.	82	16
CHANNEL CAT	.	.	.	.	.	.	.	.	25	14	25	14
BULLHEAD	.	.	.	.	.	.	.	.	125	30	125	30
FLATHEAD	.	.	.	.	.	.	.	.	50	27	50	27
DRUM	.	.	.	.	.	.	25	4	.	.	25	4
CARP	.	.	.	.	.	.	.	.	50	6	50	6
BUFFALO	.	.	30	7	.	.	15	4	280	67	325	78
TOTAL	.	.	42	9	.	.	110	21	630	154	782	184
DAYS				3				5		115		

RIVER= MISSISSIPPI COUNTY=ST LOUIS 97

SPECIE	SEINE POUNDS	SEINE DOLLARS	TRAMMEL NET POUNDS	TRAMMEL NET DOLLARS	GILL NET POUNDS	GILL NET DOLLARS	HOOP NET POUNDS	HOOP NET DOLLARS	TROT LINE POUNDS	TROT LINE DOLLARS	TOTAL POUNDS	TOTAL DOLLARS
PADDLEFISH	.	.	175	52	.	.	.	.	.	.	175	52
GAR	.	.	33	3	.	.	.	.	1	0	34	3
Q S CARP	.	.	255	48	.	.	.	.	.	.	255	48
STURGEON	.	.	60	15	.	.	.	.	.	.	60	15
BLUE CAT	.	.	541	298	.	.	25	14	235	129	801	441
CHANNEL CAT	.	.	154	85	.	.	493	271	2056	1131	2703	1487
FLATHEAD	.	.	10	5	.	.	145	78	539	291	694	375
DRUM	.	.	67	10	.	.	15	2	88	13	170	25
CARP	.	.	705	85	.	.	.	.	.	.	705	85
BUFFALO	.	.	1150	276	.	.	121	29	900	216	2171	521
TOTAL	.	.	3150	878	.	.	799	394	3819	1780	7768	3052
DAYS				17				293		274		

RIVER= MISSISSIPPI COUNTY=SCOTT 101

SPECIE	SEINE POUNDS	SEINE DOLLARS	TRAMMEL NET POUNDS	TRAMMEL NET DOLLARS	GILL NET POUNDS	GILL NET DOLLARS	HOOP NET POUNDS	HOOP NET DOLLARS	TROT LINE POUNDS	TROT LINE DOLLARS	TOTAL POUNDS	TOTAL DOLLARS
GRASSCARP	.	.	35	7	.	.	.	.	.	.	35	7
EEL	.	.	.	.	.	.	.	.	10	2	10	2
GAR	.	.	.	.	.	.	.	.	50	5	50	5
BLUE CAT	.	.	50	27	.	.	.	.	2379	1309	2429	1336
CHANNEL CAT	.	.	.	.	.	.	22	12	2079	1143	2101	1156
BULLHEAD	.	.	.	.	.	.	.	.	20	5	20	5
FLATHEAD	.	.	.	.	.	.	36	19	50	27	86	46

1992
Reported commercial harvest of licensed fishermen from the Mississippi River — St. Louis county
dollar value is live-weight wholesale value.

SPECIAL PROBLEM INVESTIGATION
DEPARTMENT OF ENVIRONMENTAL COMPLIANCE

Reference 19

CONTROL NUMBER: 93 (YR) 07 (MO) 08 (DAY)

CROSS REFERENCE:

NEW FILE: BROOKLYN STREET PUMP STATION

TO: HOWARD EDMOND FROM: SI SMITH
DATE ASSIGNED: 07-08-93 TIME: 0800
SUBJECT: OIL IN BROOKLYN STREET PUMP STATION
SPECIAL INSTRUCTIONS: LOCATE SOURCE OF OIL ENTERING BROOKLYN STREET PUMP STATION AND TAKE CORRECTIVE ACTION

STREET ADDRESS: FOOT OF BROOKLYN STREET ZIP CODE: 63102
NEAREST INTERSECTION: MULLANPHY MAP COORDINATES: 28-D-19

TYPE OF PROBLEM: OIL ENTERING PUMP STATION
TRUNK SEWER: BCH TRTMT PLANT: BISSELL WATER COURSE: N/A

VOLUME: UNKNOWN QUANTITY: UNKNOWN
CAUSE: SOURCE: POSSIBLE LEAKING TANK

PERSON REPORTING: TELEPHONE:
CONTACT PERSON: JAMES GARAVAGLIA TELEPHONE: 622-3588

DATE OF INCIDENT: ON GOING RESPONSIBLE PARTY: CITY OF ST. LOUIS
REGULATORY AGENCY CONTACTED: MSD, MODNR, FIRE DEPT, & CITY OF ST. LOUIS
CLEAN UP BY: REACT ENVIRONMENTAL ENGINEERS

COMPLETION DATE: 08-19-93 DAMAGES BILLED ($):

INVESTIGATIVE ACTION SUMMARY: 07-08-93 Call from MSD pump station stating oil was entering Brooklyn pump station. I obtained a sample for analysis. Started looking for possible source. Located an under ground storage tank, which has large hole in the top, on the south side of a vacant building located just west of the pump station and south of Brooklyn Street. A sample of the oil still in this tank was collected. The analysis of the oil from the pump sta contained 47 mg/l of 1254 pcb's and the oil from the tank contained 39 mg/l of 1254 pcb's. I contacted Charlie Gay of the Fire Marshall's office and met him at the site on 07-16-93 to show him the problem and to obtain help in finding owner of property. Charlie contacted Chief Horn, informed him of the situation, Chief Horn contacted James Garavaglia of the comptroller's office. We met at site. It was determined at this time that the City of St. Louis is the owner of the east half of the property between 1st St. and the flood wall and Wheeler Ferry Company owns the west half. Cont. Page two

CONCLUSION: It appears at this time an underground storage tank is the cause of this problem. Also the possibility exist of ground saturation of oil from an old Union Electric building.

Copy sent to: Date:

SPECIAL PROBLEM INVESTIGATION continued:

93 Yr 07 Mo 08 Day

BROOKLYN PUMP STATION

DETAILS OF INVESTIGATION: The City is to locate owners of the property and take action on getting area cleaned up. They contacted React Environmental Engineers.

07-16-93 Met with city engineers and React to determine what is to be done. At the present time React is placing booms in the wet well of the pump station to soak up the oil entering. It was not determined at this time what to do with the underground tank. React wanted to trench along the sewer entering the pump station but due to the high water table and the possibility of causing a major problem with the flood waters no trench at this time.

07-26-93 Returned to the pump station to follow up on the clean up. React did not place booms in station they only put absorbent pads. The pump station maintenance crew removed the pads to prevent them from being pulled into the pumps since they were not tied down. I contacted the city comptroller and informed him of this problem. React contacted me and I told them that they had to use booms inside the station and tied to prevent any possibility of being pulled into the pumps or move outside station into the first manhole up stream to collect the oil.

07-27-93 Met Chief Horn at the pump station. React has installed boom and they are tied. Checked the underground tank and nothing has been done to the tank. It still has oil standing in the bottom. It appears that there could be at least 6 to 8 inches of oil in the tank. There is still a small oil sheen on the water entering the station. Chief Horn is to find out what is to be done with the tank and let me know.

07-28-93 Met Chief Horn and Clifford Trice, chief engineer for Terminal Railroad Association at the site of the underground tank. It has been determined that the property belongs to Terminal Railroad. They are to take steps to remove the tank.

07-29-93 Received call from Daryl Bowles, Gehm Corp, rep for Terminal Railroad requesting copies of analysis on pump station and tank. They are to preform an infrared test on area to try and determine just where the oil is entering the sewer. Test is to be done first week of August. Copies of analysis sent.

08-03-93 Made follow up on progress of clean up. The area around the tank has been cleaned up and graded but the opening to the tank has been covered. No way at this time to tell if tank has been pumped. The booms at the pump station do not appear to have been serviced since they were last installed. TE

SPECIAL PROBELM INVESTIGATION continued

93 Yr 07 Mo 08 Day

BROOKLYN PUMP STATION

08-04-08 Met with Terminal Railroad, consulting company and fire department underground tank is being pumped out today. Tank will be removed as soon as the water level goes down. The infrared pictures that were taken do not indicate the source of oil in pump station is from tank. They did indicated a possible location of another underground tank on the city property just south of Mound Street. Fire department was notified.

08-08-93 1015 Hrs Received call from Chief Horne requesting my presents at 1st & Mullanphy. Three manholes were located along the flood wall which contained a large amount of oil. Could not determine at this time where oil is coming from. The manholes are holding water. I will return 08-09-93 to collect samples to find out if pcb's are present. There is some question as to the manholes belonging to MSD or the City.

08-09-93 Collected oil samples from all three manholes. Waiting on analysis.

08-10-93 Met Charlie Gay of fire department. He wanted to know where the manholes were located that contain this last source of oil. Also wanted to look at clean up that was preformed on the underground tank. The tank has been pumped and washed out. The oil has been remove.

08-17-93 The analysis of the samples taken from the manholes indicated they also contained a small amount of pcb 1254. These manhole belong to the city and Fire Marshall Horne was notified of this fact and also the results of the analysis on the manholes. The pads at the pump station have not been changed as of 08-17-93. Chief Horne was also informed of this situation.

08-19-93 The pads at the pump station were changed yesterday 08-18-93. The City of St. Louis is now taking care of having this problem cleaned up.

Reference 20

STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MEMORANDUM

DATE: December 29, 1993

TO: Don Falls, Environmental Specialist, HWP, DEQ

FROM: Edith Starbuck, Geologist, Environmental Geology Section, DGLS

SUBJECT: PA/SI Geology Report for the Mound Street Site, St. Louis City

Enclosed is my report on the geologic and hydrologic considerations for the Mound Street Site. The report addresses specific conponents of the HRS. Please let me know if you have any questions or comments or need additional information.

3.0.1 General Considerations

The Mound Street site is located on the riverfront in the City of St. Louis. It is east of Second Street between Mound and Brooklyn Streets.

3.0.1.1 Groundwater target distance limit

The site is located on a narrow strip of alluvium between an area of limestone bedrock and the Mississippi River. (Ref. 1) The groundwater within the alluvium will move generally in the direction of the river, that is, to the east or southeast, and it will eventually discharge to the river. During unusually high river stages, the groundwater may temporarily flow away from the river. Since no confining layer is known to exist between the alluvial aquifer and the bedrock of Mississippian limestone (Ref. 4, p. I-136), the groundwater target distance should extend for a four mile radius from the site.

3.0.1.2 Aquifer boundaries

The shallowest material at the site is fill material. Its thickness is unknown, but is estimated at 15 to 18 feet.

The alluvium consists of a mixture of stratified sediments deposited by the river. Based on findings at a nearby site, the alluvium is made up of clay, and silty clay in the top 10 to 30 feet, but becomes generally coarser with depth, becoming silty sand and sand. Lenses of gravel can be found. (Ref. 2, p. 3-19 to 3-33) The total thickness of the alluvium is estimated at approximately 80 feet. The alluvial aquifer can be expected to yeild large quantities of fresh water. (Ref. 15, p. 21) The depth to water will be approximately 20 feet. The bedrock is Mississippian aged limestone.

The Mississippian System in this area is made up of a sequence of limestone, cherty limestone, and sandy or shaley limestones. This system includes, in decending order; the Ste. Genevieve Limestone, St. Louis Limestone, Salem Formation, Warsaw Formation, Burlington-Keokuk Limestone, and the Fern Glen Formation. (Ref. 13) The Salem and Warsaw formations are generally shaley limestones and do contain shale beds in the St. Louis area. (Ref. 14, p. 101-110) However, the thickness and position of shale horizons varies within this area (Ref. 14, figs 88, 89, 91, 92) The shallowest reliable aquitard in the area is the Maquoketa Shale at the top of the Ordovician System. The Mississippian aquifer might yield small quantities of fresh water in the target area, (Ref. 15, Ref. 16) but very little data is available. Any groundwater below the Maquoketa is expected to be mineralized. (Ref. 15, Ref. 16)

3.0.1.2.1 Aquifer interconnections

Drilling at a nearby site encountered no confining material between the alluvium and bedrock. (Ref. 4, p. I-136) The bedrock and alluvium can be considered one aquifer for HRS purposes.

3.0.1.2.2 Aquifer discontinuities

The alluvial aquifer is bounded by the limits of its deposition within the target area. Bedrock faulting in the area does not completely transect the Mississippian aquifer. No aquifer discontinuity exists within the target area.

3.1 Likelihood of release

3.1.2 Potential to release

3.1.2.2 Net precipitation

The assigned net precipitation factor value for the site is 3. (Ref. 3, figure 3-2)

3.1.2.3 Depth to aquifer

The depth to groundwater at the site is approximately 20 feet. The alluvial sediments at this depth may not be good aquifer material, however, the depth at which the alluvial material is saturated should be considered the aquifer. The depth to aquifer factor value is 5. (Ref. 3, table 3-5)

3.1.2.4 Travel time

The hydraulic conductivity for the shallow part of the alluvium consisting of silty clay and clay has been calculated at 9.9×10^{-6}. (Ref. 4, p. 6-26) It's thickness ranges from 10 to 30 feet. The travel time factor value is 15. (Ref. 3, table 3-7)

3.3.1 Nearest well

There is not believed to be any groundwater use within the target area. (Ref. 4, p. I-136; Ref. 5; Ref. 6). The nearest well factor value is 0. (Ref. 3, table 3-11)

3.3.4 Wellhead protection area

There is no wellhead protection area within the target area.

4.1.1.1 Definition of hazardous substance migration path for overland/flood migration component

The site is located on top of the flood wall constructed to protect the area from flooding. No channels or ditches were observed crossing the site. (Ref. 7) Much of the site is relatively flat. The eastern edge of the area slopes to the east, toward the river. The site is less than 300 feet from the river.

4.1.1.2 Target distance limit

The target distance limit should include the Mississippi River from the area downgradient from the site to a point fifteen miles downstream. This should be at approximately Mississippi River mile marker 166.

4.1.2.1.2.1 Potential to release by overland flow

4.1.2.1.2.1.2 Runoff

The drainage area for the site is less than 50 acres. (Ref. 8) the drainage area value is 1. (Ref. 3, table 4-3) The soil at the site appeared to be somewhat coarse textured. (Ref. 7) A moderate infiltration rate would be expected. The soil group designation is B. (Ref. 3, table 4-4) The two-year, 24-hour rainfall for the area is approximately 3.5 inches. (Ref. 9)

The rainfall/runoff value is 4. (Ref. 3, table 4-5) The runoff factor value is 1. (Ref. 3, table 4-6)

4.1.2.1.2.1.3 Distance to surface water

Since no ditches or channels were noted, the distance to surface water is estimated as a straight line between the site and the river. This distance is about 300 feet. (Ref. 8) The distance to surface water factor value is 20. (Ref. 3, table 4-7)

4.1.2.1.2.2 Potential to release by flood

4.1.2.1.2.2.2 Flood frequency

The site is located on top of a flood wall constructed to withstand a 500-year flood. It is elevated above the floodplain and therefore, the flood frequency factor value is 0. (Ref. 3, table 4-9)

4.1.2.3.1 Nearest intake

On the Missouri side of the Mississippi River, the nearest intakes are approximately 10 miles upstream from the site and 126 miles downstream. (Ref. 11) Information from the Illinois Water Survey indicates that there is a public water supply intake within the target area on the Illinois side. This intake is in the SE 1/4 of the SW 1/4 of section 11, T.2 N., R.10 W. in St. Clair County, Illinois. (Ref. 10) This would be less than one mile downstream from the site.

The Mississippi River is a very large river with an average flow greater than 100,000 cfs. (Ref. 12, p. 180) The assigned dilution weight is 0.00001. (Ref. 3, table 4-13) Because of this small dilution weight, the intake factor value is 0. (Ref. 3, p. 51613)

REFERENCES

1. Geologic Map of St. Louis City and County, Missouri, K.G. Brill, DGLS, 1991.

2. Remedial Investigation Report for the St. Louis Site, prepared for U.S. Department of Energy under the Formerly Utilized Site Remedial Action Program by Bechtel National, June 1991.

3. Federal Register, vol. 55, No. 241.

4. Radiological, Chemical, and Hydrogeological Characterization Report for the St. Louis Downtown Site in St. Louis, Missouri, prepared for the U.S. Department of Energy under the Formerly Utilized Site Remedial Action Program by Bechtel National, September, 1990.

5. Census of Missouri Public Water Systems, 1991, DEQ.

6. Well records for the area on file at DGLS.

7. Field observations, 10/6/93.

8. Granite City 7.5 minute topographic quadrangle, U.S. Geological Survey, 1954, photorevised 1982.

9. Rainfall Frequency Atlas of the United States, Technical Paper No. 40, U.S. Department of Commerce.

10. Telephone messages from Dorothy Waller, Illinois Water Survey, June 11, and 12, 1992.

11. Census of Missouri Public Water systems, 1991, DEQ.

12. Water Resources Data, Missouri, Water Year 1989, U.S. Geological Survey Water-Data Report MO-89-1.

13. Geologic Map of St. Louis City and County, Missouri, K.G. Brill, DGLS, 1991.

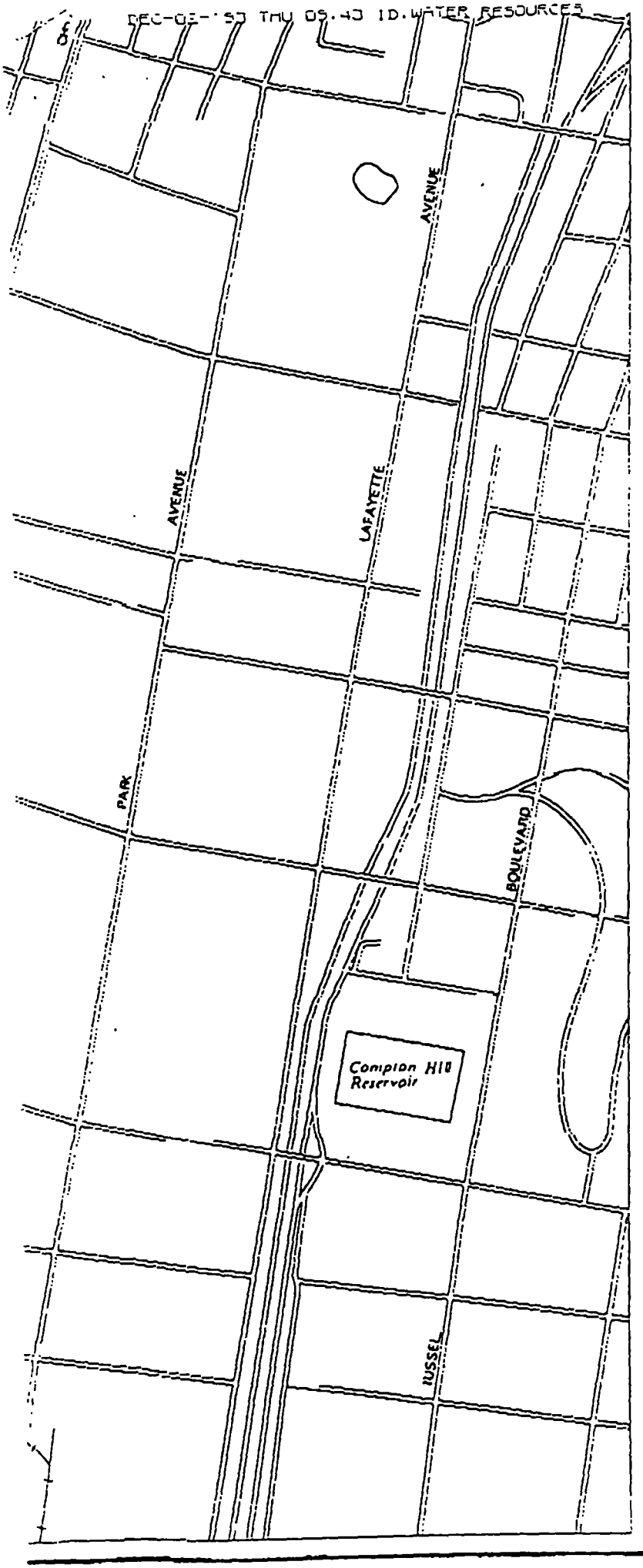
14. Paleozoic Succession in Missouri-Part 4, Mississippian System, Report of Investigation No. 70, Part 4; Thomas L. Thompson; DGLS, 1986.

15. Water Resources, St. Louis Area, Missouri, Water Resources Report No. 30; Don E. Miller, et. al.; DGLS/USGS; 1974.

16. Groundwater Areas Map in Groundwater Maps of Missouri; Missouri Geological Survey and Water Resources; 1963.

shown on this map to determine when actuarial rates apply to structures in the zones where elevations or depths have been established

To determine if flood insurance is available in this community, [illegible] Program, at (800) 638-6620, or (800) 424-8872.



APPROXIMATE SCALE

1000 0 1000 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

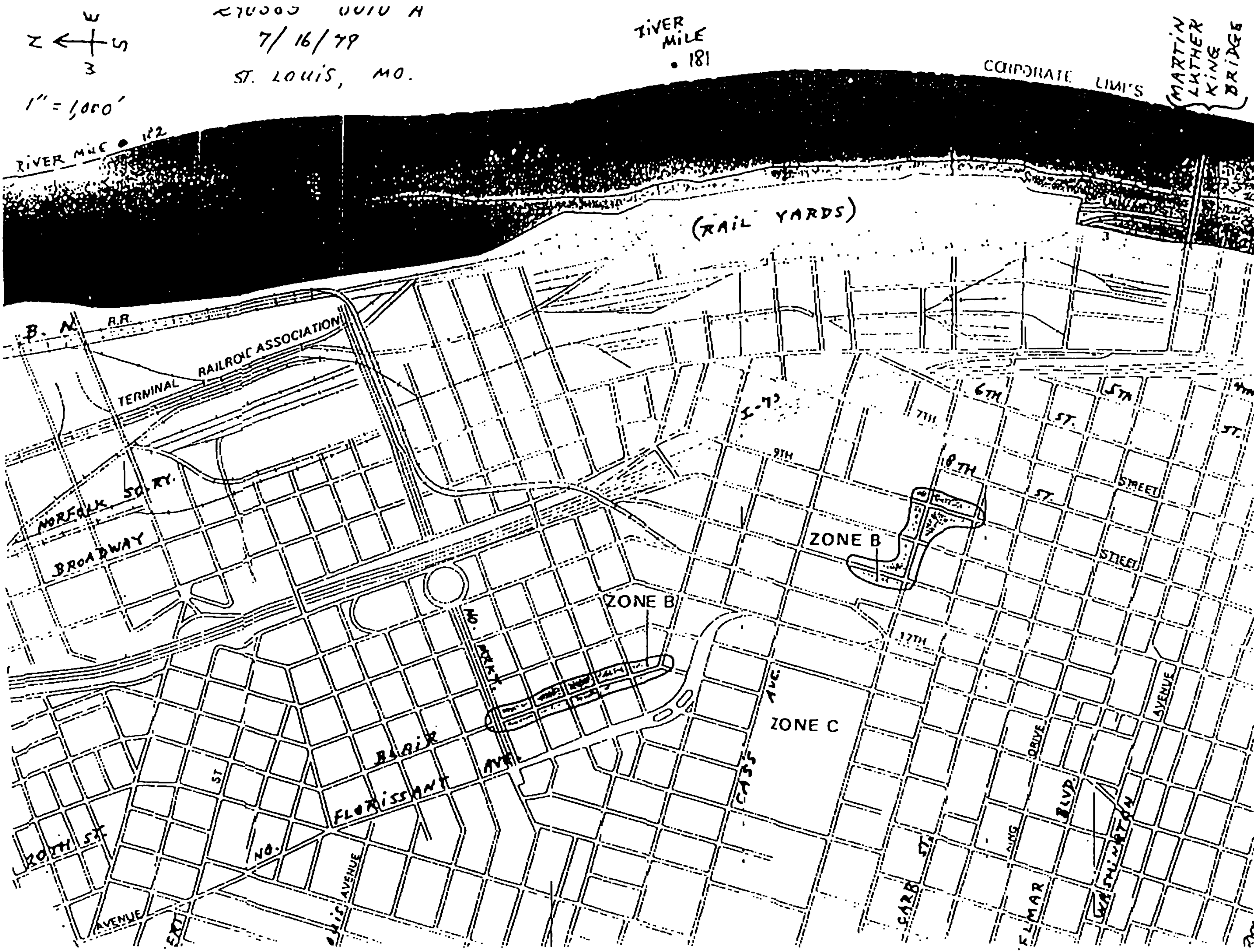
CITY OF
ST. LOUIS, MISSOURI
INDEPENDENT CITY

PANEL 10 OF 40
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
290385 0010 A

EFFECTIVE DATE:
JULY 10, 1979

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
FEDERAL INSURANCE ADMINISTRATION



7/16/79
ST. LOUIS, MO.
1" = 1,000'
RIVER MILE • 181
RIVER MILE • 182
CORPORATE LIMITS
(MARTIN LUTHER KING BRIDGE)
(RAIL YARDS)
B. N. R.R.
TERMINAL RAILROAD ASSOCIATION
NORFOLK SO. RY.
BROADWAY
I-70
6TH
5TH
ST.
7TH
9TH
8TH
ST.
STREET
STREET
ZONE B
ZONE B
ZONE C
17TH
BLAIR
NO. MARKET
NO. FLORISSANT AVE.
CASS AVE.
20TH ST.
NO.
AVENUE
AVENUE
AVENUE
CARR ST.
DRIVE
ELMAR
BLVD.
WASHINGTON
AVENUE
ST

STATE OF MISSOURI
OFFICE INFORMATION MEMO

DATE: 6/11/92 TIME: ☐ AM ☒ PM 3:30

TO: Edie

DEPARTMENT OR DIVISION:

FROM: Dorothy Walley

DEPARTMENT OR COMPANY: ILL Wtr Survey

PHONE NO: 217-333-7223

RECEIVED BY: KB

- ☒ Called/was here to see you
- ☐ Wants to see you
- ☐ Will call again
- ☐ Wants you to call
- ☐ URGENT
- ☐ Returned your call
- ☐ Prepare for my signature
- ☐ For your information
- ☐ Review
- ☐ Take necessary action
- ☐ For your signature
- ☐ As requested

REMARKS MESSAGES

Pub. Wtr. Supply Intakes on Miss. River

(2) in East St L. - Illinois American Wtr Co.

T4N - R10W - S.25 (SW corner)

T2N - R10W - S.11 (SE corner of SW 1/4)

(1) in Alton

T5N - R1CW - S.4 (SE corner)

none in Illinois Co (217) 333-5482

MO 999-9007 (5-86)

Surface Wtr. Sect / Sally ~~Ed~~ Broeren

STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MEMORANDUM

DATE: January 5, 1994

TO: Don Falls, Environmental Specialist, HWP, DEQ

FROM: Edith Starbuck, Geologist, DGLS

SUBJECT: Existence of karst near the Mound Street Site

Sinkholes and caves can be found in the Mississippian bedrock within the target area. The sinkholes are represented as closed depressions on the Granite City topographic map. Also, the existence of karst features is discussed in the DGLS publication, "Engineering Geology of St. Louis County, Missouri". The karst aquifer probably does not directly underlie the site, however, and it is not likely to be affected by contaminant migration from the site. If the site is actually on the bedrock residual area, any water that percolates down into it should move toward the alluvial aquifer since groundwater movement is toward the river.

Please let me know if you have any further questions about the site geology (314)368-2136.

ES:kb

MOUND STREET SITE STRATIGRAPHY				
	Stratigraphic Unit	Composition	Thickness (ft.)	Remarks
Quaternary System	Alluvium	Clay, silt, sand, gravel	80	High yield aquifer
Mississippian System	Ste. Genevieve Formation	Silty to sandy limestone	470 - 530	Yields small to moderate quantities of water
	St. Louis Limestone			
	Salem Formation			
	Burlington-Keokuk Limestone	Cherty limestone	240	
	Fern Glen Formation	Red limestone and shale	100	
	Chouteau Group	Limestone, shale and siltstone	0 - 122	
Devonion System	Sulphur Springs Group	Sandstone and limestone	0 - 60	
	Grassy Creek Shale	Carbonaceous Shale	0 - 50	
Silurian System		Cherty limestone	0 - 200	
Ordovician System	Maquoketa Shale	Silty, limey, or dolomitic shale	150	Confining layer

Header Data

Log # 019835
Owner:NORTHWESTERN COOPERAGE CO
St:MO Cnty:ST. LOUIS
SE SE NE TRS: S02 T45N R07E
Alias:
Lat.:38,40,23.648N
Type well:Private Well
Long.:90,11,25.660W
Type log: S
Quad:38090C6
Driller:HAVERSTICK WELL CO Date: /
Driller License No:
Confidential:N Release Dt. /
Logger:C.E. ROBERTSON Date:08/1961

Elev.: 420 Elev.S Yield: 260 SWL:(a) H20 @:
T.D.: 80 base: DrDwn: 31 SWL:(b)

Bedrock at: 75 Samples saved:N Int. cored: 0 to 0
Top Fm.:HOLOCENE ALLUVIUM
Bot Fm.:MISSISSIPPIAN SYSTEM
Problems:
Remarks:

Construction Data

Log #:019835 Date Completed: /

CASING: Dpth: 59 Diam: 8.00 I/O:O Sz. Hole: 0.00 Sz. Below: 0.00
0 0.00
0 0.00
0 0.00

GROUT:	Type	Rig	Methd	Dt Abnd	Plug Date	Top	Bottom
				/	/	0	0

PUMP:	Cap	Type	Set at	TDH	Scrn Typ	Size	Lgth	Slot
	0		0	0		0	0	0

Well Treat	Type Dev	Typ Compl	Perf. Interval	Tube Pres.	Oil	Gas
			Top: 0 Bot: 0			

Open Top:HOLOCENE ALLUVIUM
Formations Bot:MISSISSIPPIAN SYSTEM
Other data sources:
Remarks:

Stratigraphy Data

Log #:019835

Top	Base	Name	--Lith-- Pr	Sc	Mn	Minerals--- Pri	Oc	Sec	Oc	Mnr	Oc
0	75	HOLOCENE ALLUVIUM	CL	SD	GR		0		0		0
75	80	MISSISSIPPIAN SYSTEM	LS	SD			0		0		0

Printed on 12/30/93 at 10:45:40.

- - - - - - - - - - - - - - - - H e a d e r D a t a - - - - - - - - - - - - - - - -

Log #: 001655
Owner: BELCHER HOTEL
Alias type: Facility ID
Alias: 010000
St: MO Cnty: ST. LOUIS
NE SW SW TRS: S13 T45N R07E
Lat.:
Long.:
Quad: UNKNOWN
Type well: Noncommunity Public Well
Type log: D
Driller:
Date: /
Driller License No:
Confidential: N Release Dt. /
Logger:
Date: /

Elev.: 420 Elev.S Yield: 150 SWL:(a) H20 @:
T.D.: 2200 base: DrDwn: 000 SWL:(b)

Bedrock at: 0 Samples saved: N Int. cored: 0 to 0
Top Fm.:
Bot Fm.:
Problems:
Remarks:

- - - - - - - - - - - - - - C o n s t r u c t i o n D a t a - - - - - - - - - - -

Log #: 001655 Date Completed: 09/1951

CASING: Dpth: 80 Diam: 160.0 I/O: O Sz. Hole: 0.00 Sz. Below: 0.00
0 0.00
0 0.00
0 0.00

GROUT:	Type	Rig	Methd	Dt Abnd	Plug Date	Top	Bottom
				/	/	0	0

PUMP:	Cap	Type	Set at	TDH	Scrn Typ	Size	Lgth	Slot
	0		0	0		0	0	0

Well Treat	Type Dev	Typ Compl	Perf. Interval	Tube Pres.	Oil	Gas
			Top: 0 Bot: 0			

Open Top:
Formations Bot:
Other data sources:
Remarks:

- - - - - - - - - - - - - - S t r a t i g r a p h y D a t a - - - - - - - - - - -

Log #: 001655

Top	Base	Name	--Lith-- Pr	Sc	Mn	Pri	Oc	Minerals Sec	Oc	Mnr	Oc
0	230	ST LOUIS LIMESTONE	LS	SH			0		0		0
230	350	SALEM FORMATION	LS	CH			0		0		0
350	380	UNKNOWN	SH				0		0		0
380	460	WARSAW FORMATION	LS	SH			0		0		0
460	630	KEOKUK-BURLINGTON LS. UNDIFF	LS	SH			0		0		0
630	720	FERN GLEN FORMATION	LS	SH	CH		0		0		0
720	760	KINDERHOOK SHALE	SH				0		0		0
760	880	SILURIAN SYSTEM	LS				0		0		0
880	1040	MAQUOKETA SHALE	SH	LS			0		0		0
1040	1180	KIMMSWICK LIMESTONE	LS				0		0		0
1180	1240	DECORAH GROUP	LS	CH			0		0		0
1240	1370	PLATTIN LIMESTONE	LS				0		0		0
1370	1502	JOACHIM DOLOMITE	SH	LS			0		0		0
1502	1640	ST. PETER-EVERTON FMS. UNDIFF	SS				0		0		0
1640	2200	CAMBRIAN SYSTEM	SS	LS			0		0		0

Printed on 12/30/93 at 10:49:09.

Header Data

Log # 003616 Owner:CUPPLES COMPANY St:MO Cnty:ST. LOUIS
SE NE NW TRS: S02 T45N R07E
Alias: Lat.:
Type well:Private Well Long.:
Type log: S Quad:UNKNOWN
Driller:WISE Date:05/1936
Driller License No: Confidential:N Release Dt. /
Logger:GROHSKOPF Date: /

Elev.: 421 Elev.S Yield: 15 SWL:(a) H20 @:
T.D.: 885 base: DrDwn: 0 SWL:(b)

Bedrock at: 0 Samples saved:N Int. cored: 0 to 0
Top Fm.:ST LOUIS LIMESTONE
Bot Fm.:SILURIAN SYSTEM
Problems:
Remarks:

Stratigraphy Data

Log #:003616

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210	325	SALEM FORMATION	LS	CH	SH		0		0		0
325	435	WARSAW FORMATION	SH	LS	CH		0		0		0
435	595	KEOKUK-BURLINGTON LS. UNDIFF	CH	LS			0		0		0
595	700	FERN GLEN FORMATION	CH	LS	SH		0		0		0
700	735	CHOUTEAU GROUP	LS	CH			0		0		0
735	755	CHATTANOOGA SHALE	SH				0		0		0
755	885	SILURIAN SYSTEM	LS	SD	DL		0		0		0

Printed on 12/30/93 at 10:47:17.

- - - - - - - - - - - - - - - H e a d e r D a t a - - - - - - - - - - - - - - -

.Log # Owner:FISHER CHEMICAL CO St:MO Cnty:ST. LOUIS
002748 NW SE SE TRS: S02 T45N R07E
Alias: Lat.:
Type well:Private Well Long.:
Type log: S Quad:UNKNOWN
Driller:WISE Date:08/1933
Driller License No: Confidential:N Release Dt. /
Logger:GLEASON Date: /

Elev.: 430 Elev.S Yield: 30 SWL:(a) H20 @:
T.D.: 210 base: DrDwn: 150 SWL:(b)

Bedrock at: 45 Samples saved:N Int. cored: 0 to 0
Top Fm.:ST LOUIS LIMESTONE
Bot Fm.:ST LOUIS LIMESTONE
Problems:
Remarks:

- - - - - - - - - - - - - C o n s t r u c t i o n D a t a - - - - - - - - - - -

Log #:002748 Date Completed:08/1933

CASING: Dpth: 30 Diam: 8.00 I/O:O Sz. Hole: 0.00 Sz. Below: 8.00
0 0.00
0 0.00
0 0.00

GROUT:	Type	Rig	Methd	Dt Abnd	Plug Date	Top	Bottom
				/	/	0	0

PUMP:	Cap	Type	Set at	TDH	Scrn Typ	Size	Lgth	Slot
	0		0	0		0	0	0

Well Treat	Type Dev	Typ Compl	Perf. Interval	Tube Pres.	Oil	Gas
			Top: 0 Bot: 0			

Open Top:ST LOUIS LIMESTONE
Formations Bot:ST LOUIS LIMESTONE
Other data sources:
Remarks:

- - - - - - - - - - - - S t r a t i g r a p h y D a t a - - - - - - - - - - -

Log #:002748

Top	Base	Name	--Lith-- Pr	Sc	Mn	Pri	Oc	Sec	Oc	Mnr	Oc
45	210	ST LOUIS LIMESTONE	LS	CH			0		0		0

Printed on 12/30/93 at 10:46:32.

Reference 21

STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MEMORANDUM

DATE: January 5, 1994

TO: Don Falls, Environmental Specialist, HWP, DEQ

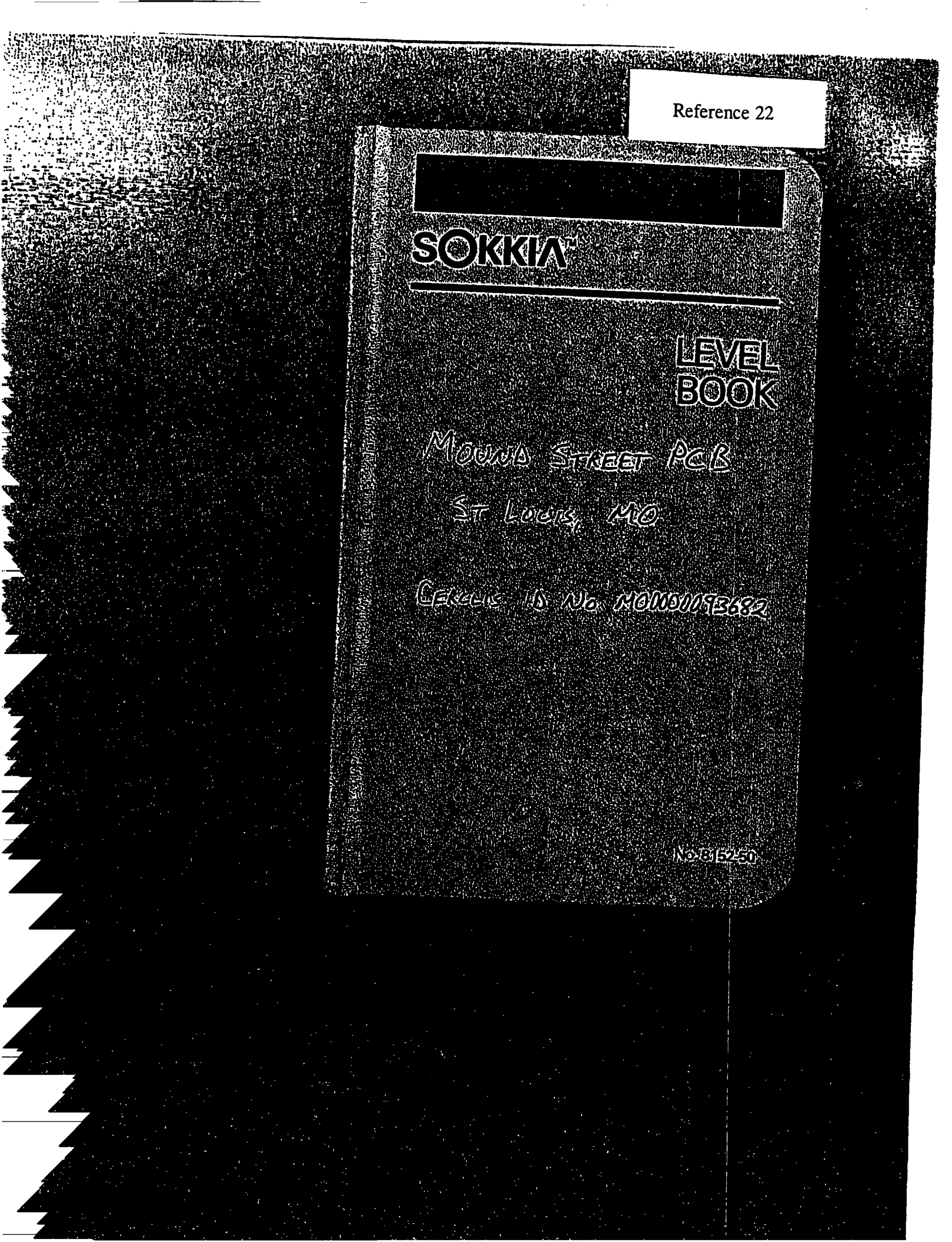
FROM: Edith Starbuck, Geologist, DGLS

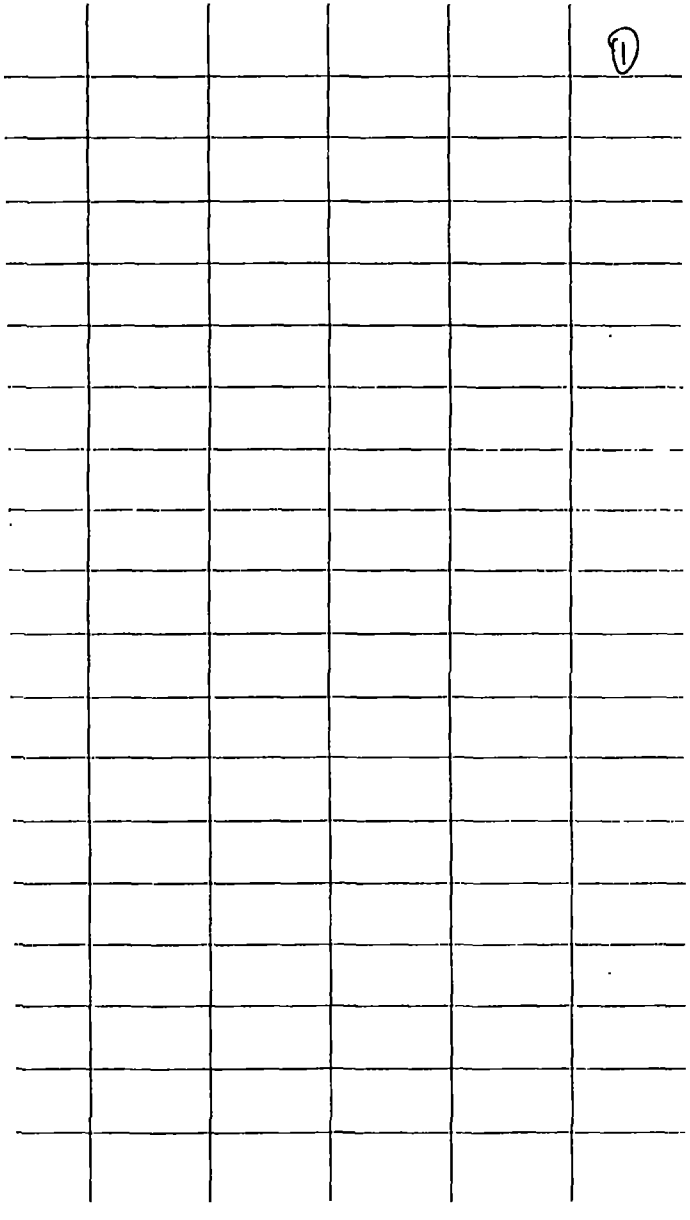
SUBJECT: Existence of karst near the Mound Street Site

Sinkholes and caves can be found in the Mississippian bedrock within the target area. The sinkholes are represented as closed depressions on the Granite City topographic map. Also, the existence of karst features is discussed in the DGLS publication, "Engineering Geology of St. Louis County, Missouri". The karst aquifer probably does not directly underlie the site, however, and it is not likely to be affected by contaminant migration from the site. If the site is actually on the bedrock residual area, any water that percolates down into it should move toward the alluvial aquifer since groundwater movement is toward the river.

Please let me know if you have any further questions about the site geology (314)368-2136.

ES:kb


Reference 22
SOKKIA
LEVEL
BOOK
Mound Street PCB
St Louis, MO
Geocis ID No. MOMO193682
No.B15250



(2) Site Recon visit - Dec 6, 1995

0700 Leave SvE Overland Park, KS office

1100 Arrive SvE St Louis office
pickup Kevin Harris

1130 Leave SvE St Louis office

1200 arrive site
begin making site schematic

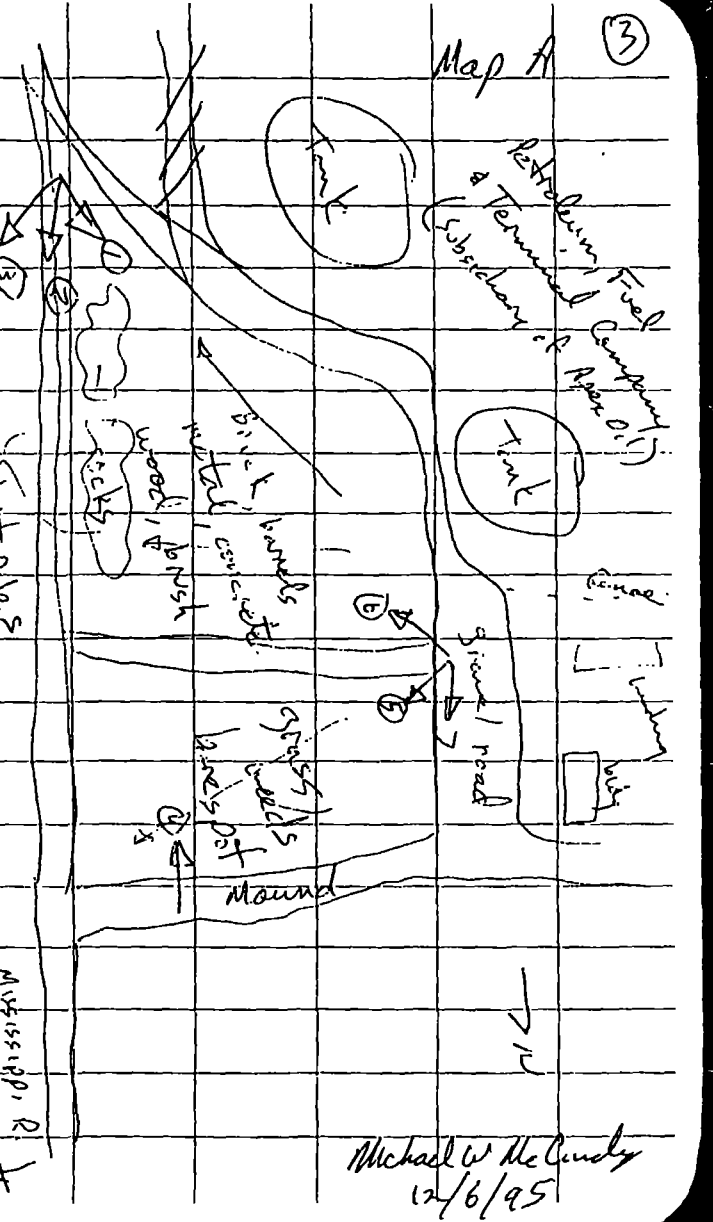
1215 Herman arrives at site
interview him (McKinley Iron rep)

1230 Herman left site

temperature 30's
mostly cloudy, slight breeze

Michael W McCurdy
12/6/95

(3) Map A



Michael W McCurdy
12/6/95

(4)

12:32 (1) looking north at south end of property

12:32 (2) looking north along gravel road

12:33 (3) looking NNE toward flood wall

12:34 (4) looking south at north end of property

12:35 (5) looking east from west side

12:37 (6) looking SSE from west side

12:38 (7) abandoned ground elevators to N (TRRA property)

[See map on preceeding page for picture location and viewing direction]

Michael W McCurdy
12/6/95

(5)

Herman Gallman interview 12:15-12:30

property size is approx 1.5 acres

basement may be as deep as 12-14' deep into the basement — don't know if removed concrete wall or floor

deeded abandoned pump house to city for bike path

own since property east of site (between gravel road & flood wall)

property originally purchased from UE for salvage of equipment

no other operations conducted at the site

Michael W McCurdy
12/6/95

(6)

- general drainage is to the east & southeast

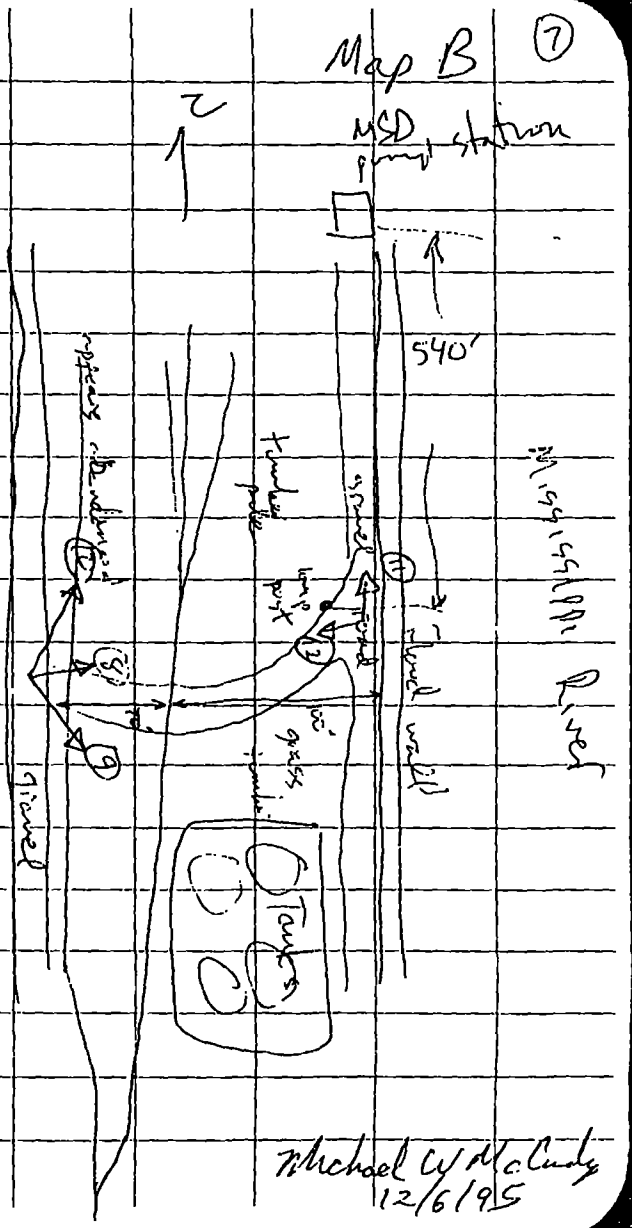
(1) looking east from gravel road (Additional property)
(2) looking SSE from gravel road (Apex tanks)
(3) looking NNE from gravel road (
(11) looking north along flood wall - pump station (MSD)
(12) looking west toward site

[See map on following page for picture location and viewing direction]

Michael W McCurdy
12/6/95

(7)

Map B



Michael W McCurdy
12/6/95

(8)

could not locate RW 12 & 11 12:58
from Corps map
found identified MHs from
corps map
UE MH abandoned
other MH abandoned
Inlet F of Corp map is
for surface runoff -
some runoff from site may
enter this storm drain -
however, it appears most
surface runoff would travel
east & south

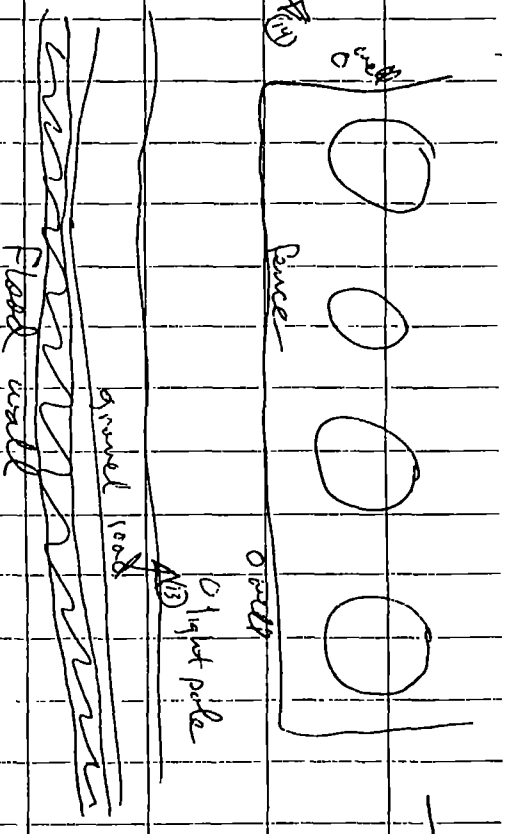
noted a dog in the Petroleum
Fuel & Terminal main yard 12:59

Michael W McCurdy
12/6/95

(9)

Map C

(13) looking west at well



(14) looking NNW at well

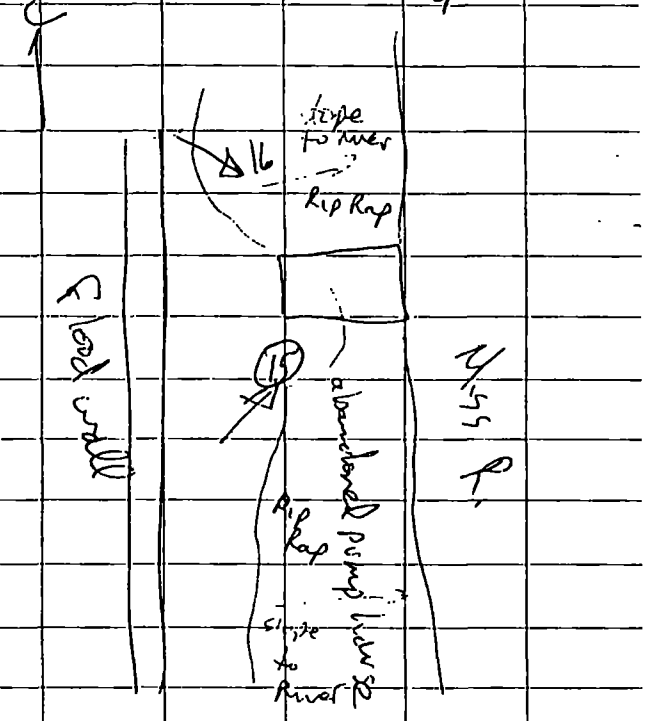
Michael W McCurdy
12/6/95

(10)

Michael W McGinty
12/6/95

(11)

Map D



13:07 (15) looking ne at abandoned pump house

13:09 (16) looking sse at abandoned pump house

Michael W McGinty
12/6/95

(12)

13:20 leave site

13:55 arrive SvE St Louis Office
drop off Kevin Harris

14:00 leave SvE St Louis Office

18:30 arrive SvE Overland Park, KS
office

Michael W McCurdy
12/6/95

(13)

Michael W McCurdy
4/1/96

Reference 23

REMEDIAL PLANNING ACTIVITIES AT SELECTED UNCONTROLLED HAZARDOUS SUBSTANCE DISPOSAL SITES IN THE ZONE OF REGIONS VI, VII, AND VIII

U. S. EPA CONTRACT NO. 68-W9-0032

FIELD SAMPLING PLAN

MOUND STREET PCB SITE
ST. LOUIS, MISSOURI

Revision 1

Work Assignment No.: 37-7JZZ

March 4, 1996

Prepared for:
U.S. Environmental Protection Agency

Prepared by:
Sverdrup Corporation, Inc.
4400 College Boulevard, Suite 160
Overland Park, Kansas 66211

Reference 24

SOKKIA™

LEVEL BOOK

MOUND STREET PCB

ST LOUIS, MO

CERCLIS ID No. MO0000093682

No. 8152-50

(14)

Michael W McCurdy
4/1/96

(15)

Site visit + sample collection

April 1, 1996

1100 leave SVE Overland Park, KS

1600 arrive SVE St Louis
pick up equipment

April 2, 1996

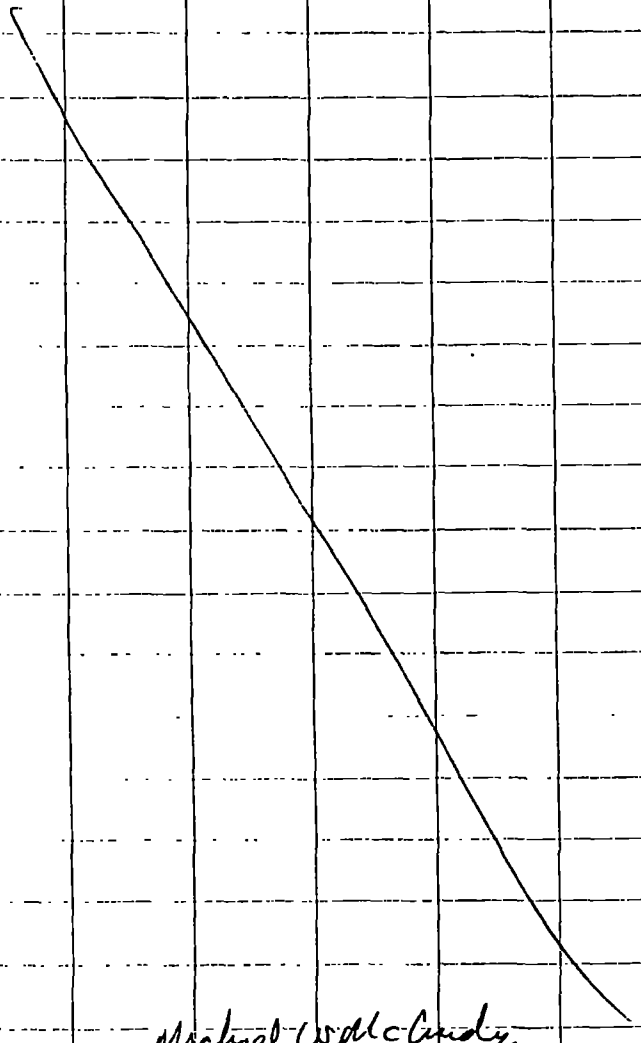
0700 leave Liverpool for site

0730 arrive site

Sunny day, 70°
windy

Michael W McCurdy 4/2/96

(16)



Michael W McCurdy
4/2/96

(17)

0730 M. May calibrate HnU

M. McCurdy calibrate
air samplers - see forms

E&E personnel on-site
Scott Hayes
Andy Mazzeo
Randy Schademann

Air sampling pumps
M. May - PCB (low flow)
R. Schademann - metals (yellow)
A. Mazzeo - VOC

Michael W McCurdy
4/2/96

(18)

E&E personnel will be operating the geoprobe and decon of equipment

M. May to log holes
see boring logs

M. May & M. McCurdy to collect samples

Photo 1 - Probe Point 1

Michael W. McCurdy
4/2/96

(19)

850 water level measurement at south well -
depth at 29.85' *
casing height 3.25'
depth = 26.60'
* top of casing - west side

915 Geoprobe setup
dummy probe to see what to expect -
hammering required
water in last section
depth at 18'

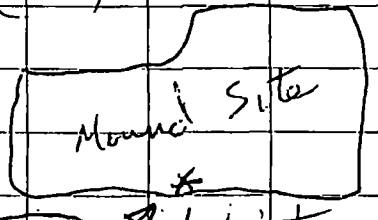


Photo 1 ⊠ Location
path to flood wall

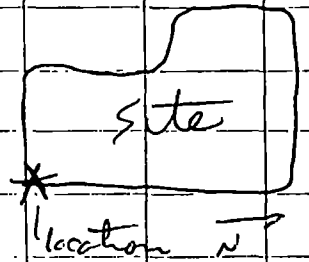
(20)

Michael W McCurdy
4/2/96

(21)

930 Sampling tube pushing
hit solid at 18.5'
water in sample tube
- concrete, brick in tube
- no reading on HNu
no sample
move to corner - South
hole backfilled with grout
not enough water to collect

955

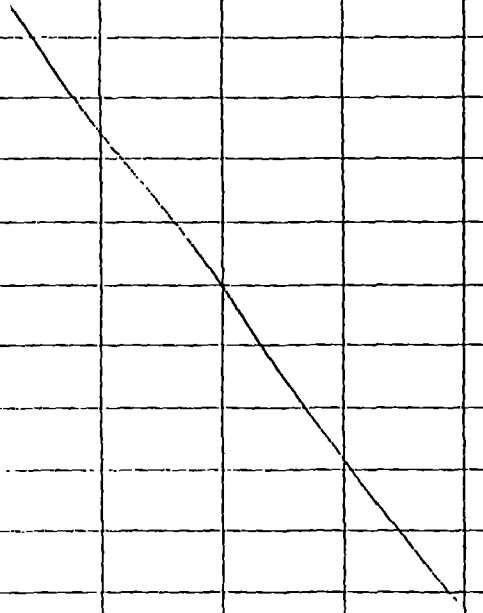


hit solid at 19.5'
possibly old asphalt
road layer in 0-3'

Michael W McCurdy
4/2/96

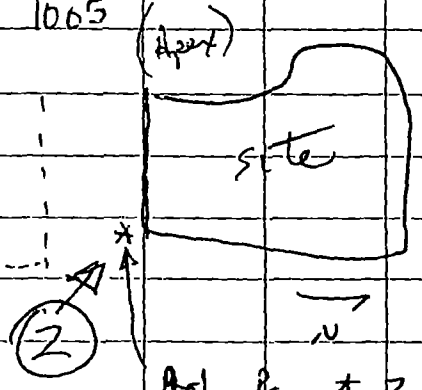
(22)

Photo 2 – Sample 101



Michael W McCurdy
4/2/96

(23)



Adobe Paint 2 Hnu

sample at 17'-19' 101 None

~~Sample at~~

hit solid at 20'

moved over 1½' for

second aliquot at

17-19 feet

Sample 101

Michael W McCurdy
4/2/96

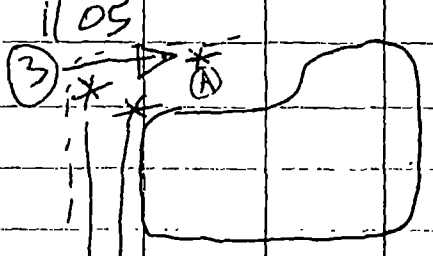
(24)

Photo 3 - abandoned area
debris rock & concrete
encountered -
no sample collected

Michael W McCurdy
4/2/96

(25)

1105



refusal at ~4'
refusal at ~1'
refusal at ~1'

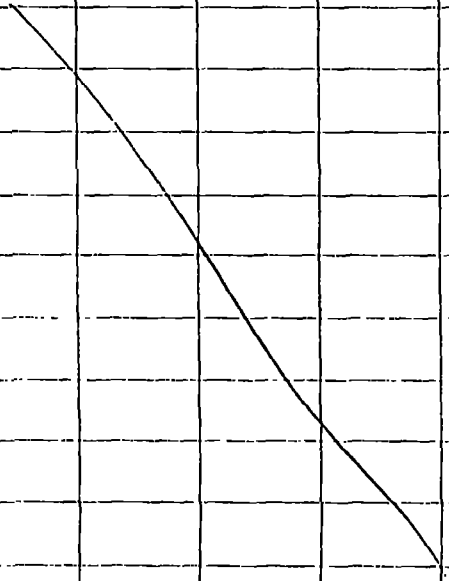
A refusal at 16'
refusal at 14'
attempt sample 10-12
sample collected 2-3"
retrieval - concrete core
no soil

no sample collected

Michael W McCurdy
4/2/96

(26)

Photo 4 – abandoned area
no sample collected
rock & debris



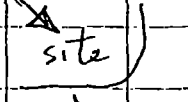
Michael W McCurdy
4/2/96

(27)

1215

refusal at 15'
refusal 12-14 sample
bricks, gravel
~ 6" sample retrieval
moved east to middle of
road

(4) → site



mud *
~ 6" sample
rock gravel
minor sand
no sample

(28)

** Stated only one sample was collected at the former building location. We were going to move to the vacant area between the flood wall & site to collect the remaining samples. Requested Dave leave a message on my voice mail at 663-2108.

Michael W McCurdy
4/2/96

(29)

1307	pack trucks for lunch
1330	leave for lunch Message with Dave Crawford at EPA *
14:10	arrive site calibrate sampling pumps

* Stated we had attempted sample collection at the former building location & were having difficulty collecting samples due to concrete, brick & rock in the subsurface.

** (previous page)

Michael W McCurdy
4/2/96

(30)

Photo 5 – Sample 103

Photo 6 – Sample 103

Photo 7 – location of geoprobe boring for 102/103

Michael W McCurdy
4/2/96

(31)

14:20

sample 16-18' attempt rock

	sample #	Hnu
sample 18-20'	102	none
sample 25'-27'	103	none

refusal at 27'

both samples submitted

Michael W McCurdy
4/2/96

(32)

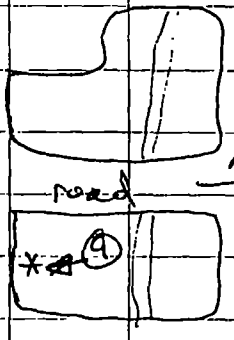
Photo 8 - sample 100

Photo 9 - location of 100 & 100D

Michael W McCurdy
4/2/96

(33)

1530



	Sample #	Hrs
Sample 25-27	100	none
Sample 25-27	100D	none

did not go beyond 27'

1610 Equipment rinsate from decontaminated sample tube after 100 soil - sample No. 008

Michael W McCurdy
4/2/96

1700 E&E personnel leave site

1715 S&E personnel leave site

1930 Message from Dave Crawford that there is not much else to do except move to the vacant area for the samples. No need to call in morning, but he will be in if needed.

Michael W. McCurdy
4/2/96

Michael W. McCurdy
4/2/96

April 3, 1996

0700 Equipment pickup
peristaltic pump works on AC when plugged in

0830 Arrive site
E&E already present

Randy Schademann
Scott Hayes
Andy Mazzeo
} E&E already on-site

Sunny day, 70°F
windy

Michael W McCurdy
4/3/96

Michael W McCurdy
4/3/96

(38)

Photo 10 - South of site

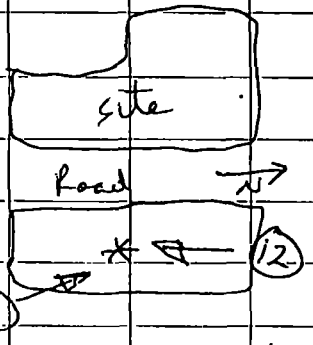
Photo 11 - Sample 104 location

Photo 12 - Sample 104 location

Michael W McCurdy
4/5/96

(39)

840



Sample 25'-27' | Sample 104 | Hand none

930 Randy to hotel to pick up shipped pump Mike May to call Wally to deliver another pump

Michael W McCurdy
4/5/96

(40)

Michael W McCurdy
4/2/96

(41)

845 Water sample from south well

plug in pump to battery on truck - pump does not work

E&E pump to arrive this morning

915 Field Blank 003

calibrate YSI meter pH only

Michael W McCurdy
4/3/96

(42)

Photo 13 - Equipment for well sampling Water level meter, YSI & pump at North well

Photo 14 - Sampling of north well

Note:

pumping nearing the maximum range of the peristaltic type pump

south well pump

TAT Engineering

Model 410-660B

Series A-93

(43)

1010 Randy & Mike return with E&E pump

1020 South well

top of casing 29.32'

casing height 3.25'

water level 26.07 bgs

well depth 49.31

casing height 3.25

bottom of well 46.06 bgs

37' Tubing

1040 pumping began south well

	T°C	Conductivity	pH	
1044	~~20.6~~ 19.2	0.948	6.84	initial
1055	19.5	0.830	6.98	retro south well
1106	19.8	0.936	6.95	"
1122	19.9	0.935	6.98	"

pump rate is approximately 0.05 gpm

Michael W. McCurdy 4/3/96

(44)

Photo 15 - South well

Photo 16 - South well

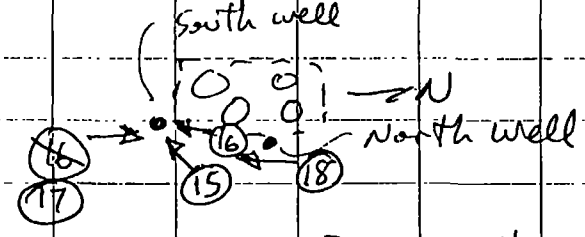


Photo 17 - From south well looking toward north well

Photo 18 - From north well looking toward south well

Michael W McCurdy
4/3/96

(45)

1128 South well

top of casing 29.58 ft

sample began 001

0010

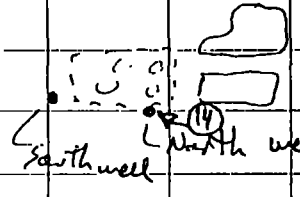
approximately 1.4 gallons removed during purging

water appears clear, no visible sediment or suspended matter. slight petroleum odor

Michael W McCurdy
4/3/96

(46)

Photo 13 - Pump & YSI setup at North well



Note: purging near the limit of the peristaltic type pump

Photo 14 - North well0

Michael W McCurdy
4/3/96

(47)

1130 North well

top of casing 28.43 north side
casing height 3.75
water level 24.68 bgs

well depth 51.02
casing height 3.75
well bottom 47.27 bgs
39' tubing

1148 pumping at north well

	T °C	conductivity	PH	
1152	18.6	.963	6.75	muted
1203	18.8	.958	6.80	clear, no solids
1214	19.7	.963	6.78	"

pumping rate is approx. 0.06 gpm

Michael W McCurdy 4/3/96

(48)

North well water -
appears clear
no visible suspended
matter or sediment
slight petroleum odor

Michael W McCurdy
4/3/96

(49)

1215 to north well
top of casing 28.54

sample began 002
approx. 1.4 gallons removed by purge

1245 sample north well
completed

1310 switch pumps at ~~north~~ south well

1335 sampling 001/0010
completed

Michael W McCurdy
4/3/96

(50)

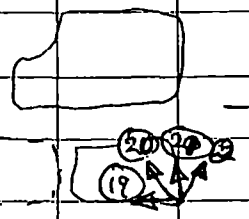


Photo 19 - Sampled area
Photo 20 - Sampled area
Photo 21 - Sampled area
Photo 22 - Sampled area

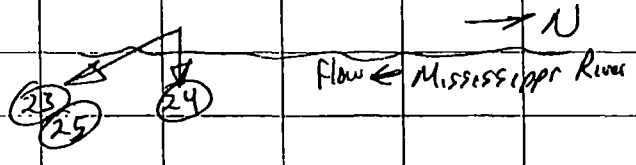


Photo 23 - Mississippi River
Photo 24 - Water intake on IL
Photo 25 - Mississippi River

Michael W McCurdy
4/3/96

(51)

1345 leave site

1445 arrive SVE St Louis office
drop off equipment

1515 leave SVE St Louis Office

2015 arrive SVE overland park

Michael W McCurdy
4/3/96

(52)

Michael W McCurdy
4/4/96

(53)

April 4, 1996

10:30 Deliver samples to EPA at Funston Rd in Kansas City, KS

11:30 Arrive EPA

End of Log Book

Michael W McCurdy
4/4/96

DEPARTMENT OF THE ARMY
ST. LOUIS DISTRICT, CORPS OF ENGINEERS
1222 SPRUCE STREET
ST. LOUIS, MISSOURI 63103-2833
27 November 1995

REPLY TO
ATTENTION OF:
Engineering Division
Geotechnical Branch

Reference 25

Mr. Mike May
Sverdrup Environmental, Inc.
4400 College Blvd., Suite 160
Overland Park, KS 66211

RE: Request for monitoring well maps, analytical data, well installation data, Mound Street PCB site, St. Louis, MO; Sverdrup Project No. 010865-37303

Dear Mr. May:

As you requested, please find enclosed maps of the construction of the St. Louis Floodwall, Reach 3, which contains Mound Street PCB site.

Please note that there are no relief wells indicated parallel with your site, the nearest wells are located to the north of Mound Street. I have not been able to locate any additional relief well information for the site area. Also, please note that there are a few manholes parallel with your site. These might be mistaken for relief wells. I have enclosed construction details of these manholes.

The sponsor, St. Louis Metropolitan Sewer District, has maintenance responsibility for the relief wells and manholes along the floodwall.

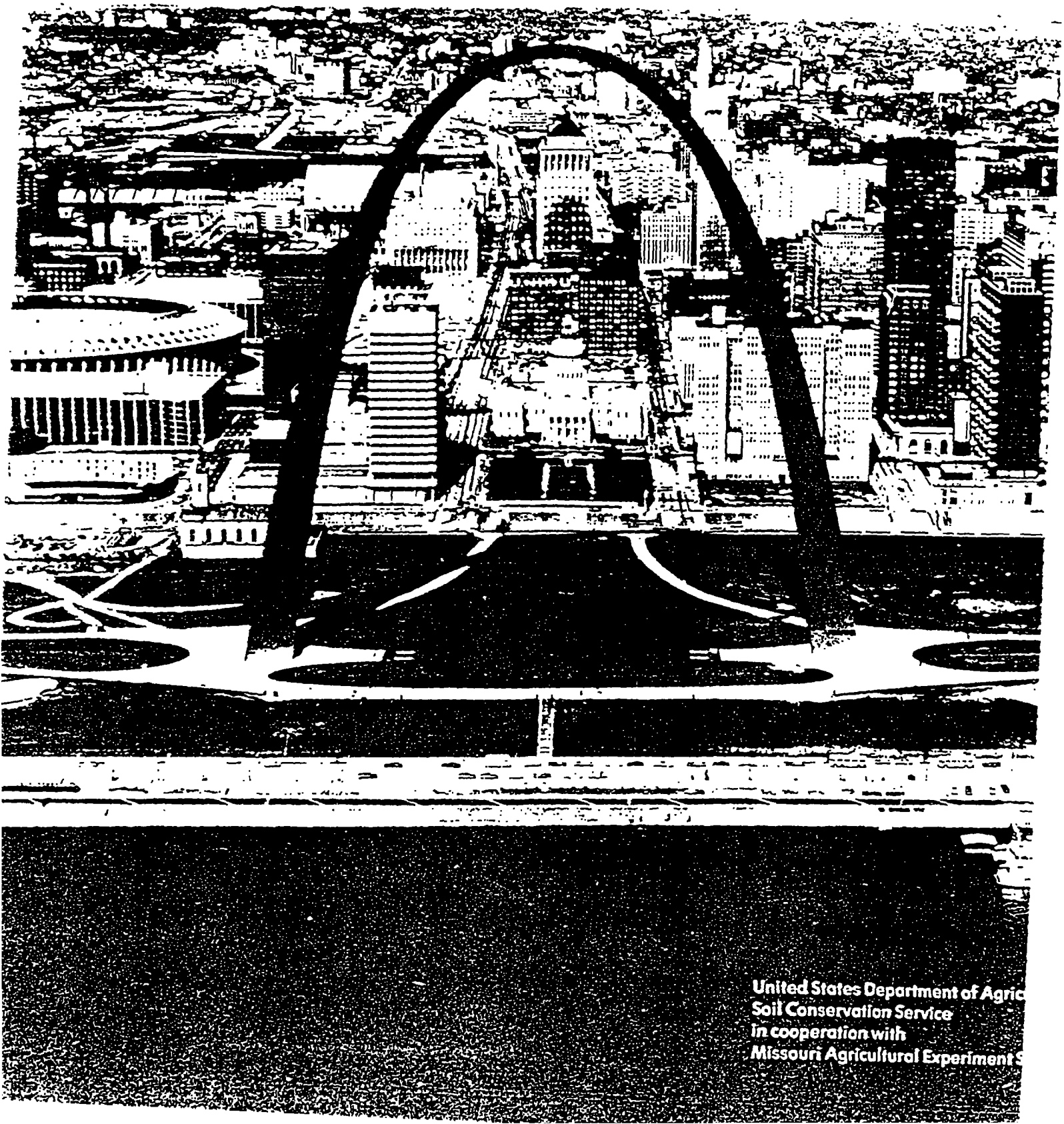
If you require additional information of the St. Louis Floodwall, please call me at (314) 331-8444.

Catherine W. Fox
Geology Section

Soil survey of

St. Louis County and St. Louis City, Missouri

Reference 26



United States Department of Agric
Soil Conservation Service
In cooperation with
Missouri Agricultural Experiment S

U.S. Department of Commerce
Economics and Statistics Administration
BUREAU OF THE CENSUS

1990 CPH-1-27

CENSUS '90

1990 Census of Population and Housing

Summary Population and Housing Characteristics

Missouri

Reference 27

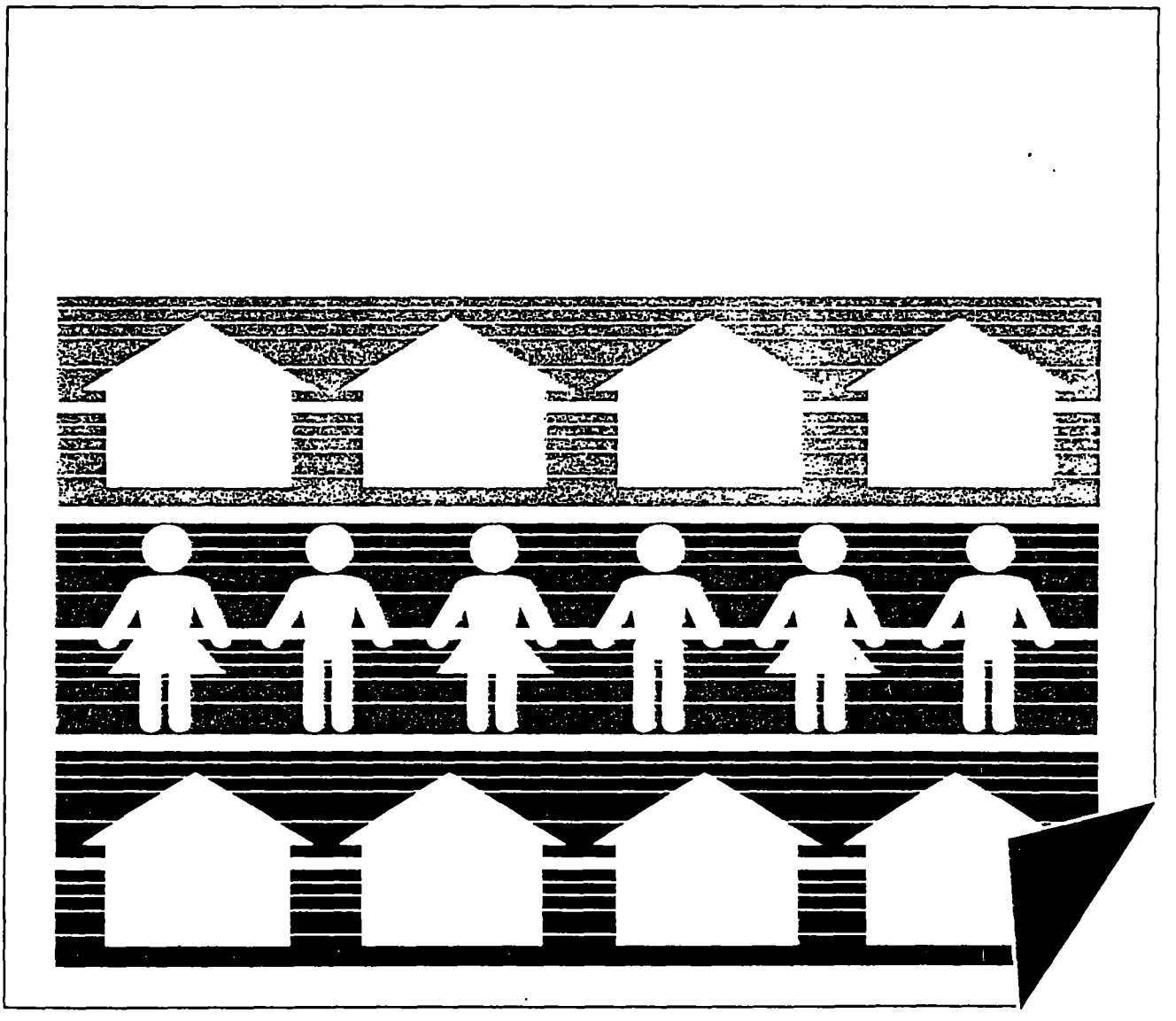


Table 5. Household, Family, and Group Quarters Characteristics: 1990—Con.

(For definitions of terms and meanings of symbols, see text)

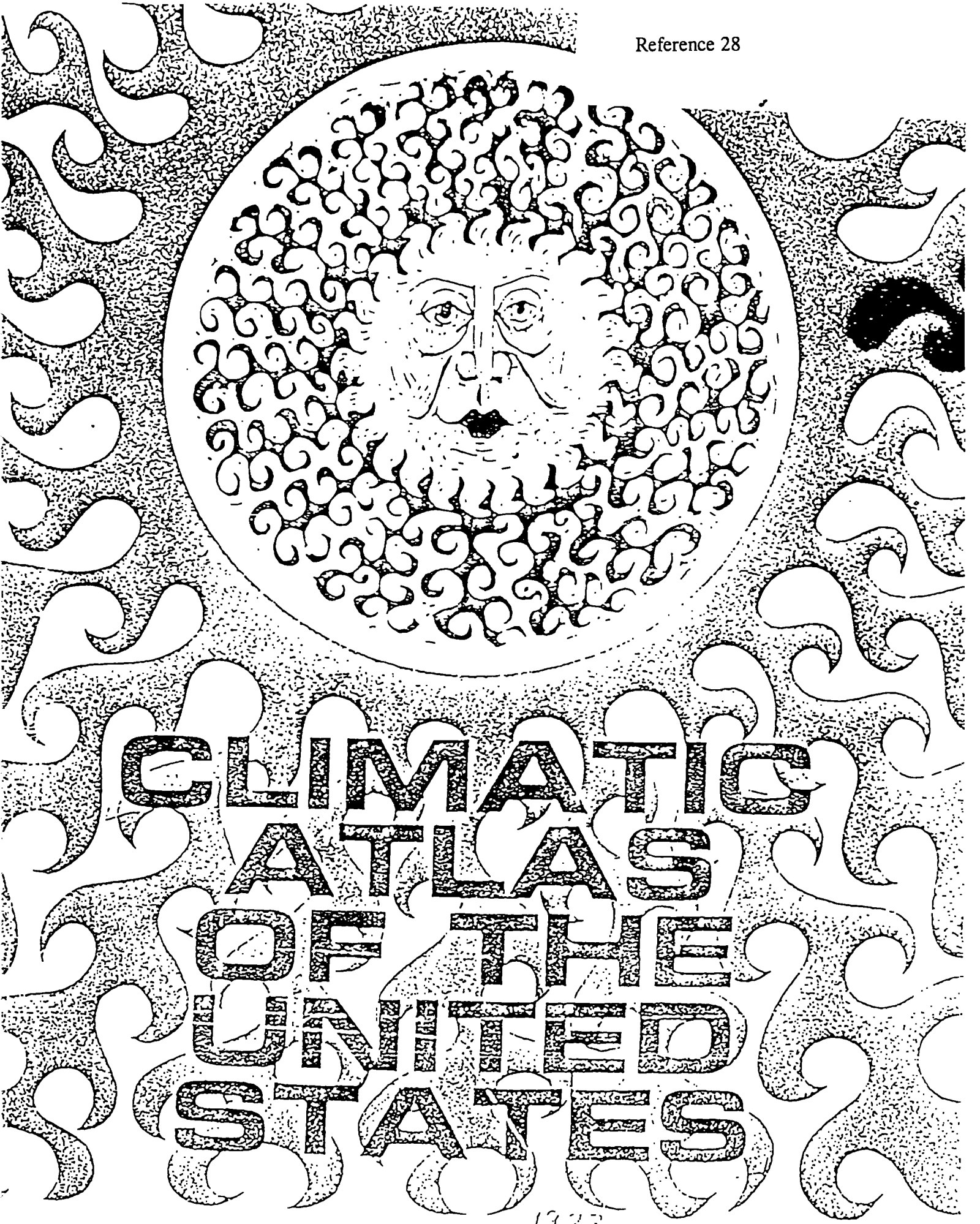
State County County Subdivision Place	Persons in households	All households	Family households			Nonfamily households				Persons per—		Persons in group quarters		
							Householder living alone							
								65 years and over						
			Total	Married-couple family	Female householder, no husband present	Total	Total	Total	Female	Household	Family	Total	Institutionalized persons	Other persons in group quarters
St Charles County—Con														
Zumbehl township	11 415	4 480	3 000	2 489	382	1 480	1 219	232	185	2.55	3.17	181	170	11
St. Charles city (pt.)	7 947	3 359	2 048	1 679	271	1 311	1 092	203	160	2.37	3.08	181	170	11
St Peters city (pt)	4	1	1	1	–	–	–	–	–	4.00	4.00	–	–	–
St Clair County	8 267	3 499	2 441	2 148	222	1 058	986	608	478	2 36	2.88	190	190	–
Appleton township	1 516	666	419	364	49	247	232	155	130	2.28	2.96	68	68	–
Appleton City city	1 212	562	331	281	44	231	218	147	124	2 16	2.89	68	68	–
Butler township	1 249	547	363	306	41	184	167	114	93	2 28	2.81	96	96	–
Lowry City city	627	297	172	132	32	125	115	93	79	2.11	2.75	96	96	–
Center township	203	77	60	51	3	17	15	7	3	2 64	2.98	–	–	–
Chalk Level township	150	58	44	38	4	14	12	6	5	2 59	3.02	–	–	–
Collins township	604	236	182	156	22	54	50	28	25	2 56	2 98	–	–	–
Collins village	144	60	39	30	9	21	21	17	16	2.40	3.13	–	–	–
Dallas township	326	129	102	94	4	27	25	12	10	2.53	2.88	–	–	–
Gerster town	40	16	10	9	–	6	6	2	2	2 50	3.30	–	–	–
Doyal township	496	203	149	139	8	54	52	28	18	2 44	2.94	–	–	–
Vista village	50	24	17	17	–	7	7	4	3	2.08	2 53	–	–	–
Jackson township	260	114	80	76	3	34	30	17	11	2 28	2.75	–	–	–
Monegaw township	285	106	85	80	3	21	19	11	10	2.69	3 07	–	–	–
Osage township	204	80	62	56	4	18	16	6	5	2 55	2.94	–	–	–
Osceola township	1 403	650	403	335	57	247	238	153	118	2 16	2.81	26	26	–
Osceola city	729	387	197	155	40	190	187	127	101	1 88	2.68	26	26	–
Polk township	179	76	59	52	4	17	17	9	7	2.36	2.73	–	–	–
Roscoe township	503	211	162	147	10	49	47	27	18	2 38	2.75	–	–	–
Roscoe village	100	46	32	28	3	14	14	7	6	2 17	2.56	–	–	–
Speedwell township	437	177	137	127	7	40	35	18	13	2.47	2.80	–	–	–
Taber township	212	78	59	56	2	19	19	11	7	2 72	3 27	–	–	–
Washington township	240	91	75	71	1	16	12	6	5	2 64	2.87	–	–	–
Ste. Genevieve County	15 792	5 707	4 416	3 878	374	1 291	1 153	625	476	2 77	3.21	245	181	64
Beauvois township	1 723	600	465	405	39	135	119	69	50	2.87	3.35	49	–	49
St. Mary city	412	174	111	80	20	63	58	34	25	2.37	3 02	49	–	49
Jackson township	2 629	936	747	672	50	189	166	85	60	2 81	3 19	–	–	–
Bloomsdale city	353	142	102	92	5	40	39	28	23	2 49	3.04	–	–	–
Ste Genevieve township	8 524	3 154	2 375	2 064	230	779	707	392	317	2 70	3.19	183	181	2
Rocky Ridge village (pt)	56	29	19	19	–	10	9	4	2	1.93	2.37	–	–	–
Ste Genevieve city	4 364	1 793	1 212	989	183	581	536	308	260	2 43	3 04	47	47	–
Saline township	887	311	252	230	14	59	54	30	19	2.85	3.21	–	–	–
Union township	2 029	706	577	507	41	129	107	49	30	2 87	3 18	13	–	13
Rocky Ridge village (pt.)	306	127	93	83	6	34	26	9	4	2 41	2 76	–	–	–
St. Francois County	45 725	17 670	13 101	10 871	1 788	4 569	4 084	2 225	1 809	2.59	3 04	3 179	2 832	347
Big River township	1 435	550	433	379	36	117	88	45	34	2.61	2.90	–	–	–
Iron township	2 899	1 105	830	686	117	275	252	161	123	2 62	3 06	22	11	11
Bismarck city	1 557	604	441	355	69	163	152	104	83	2 58	3 06	22	11	11
Iron Mountain Lake city	632	240	174	141	28	66	60	35	23	2 63	3 11	–	–	–
Liberty township	1 482	546	450	409	27	96	93	50	30	2 71	3.04	–	–	–
Marion township	1 495	537	443	403	27	94	70	23	12	2 78	3 03	–	–	–
Pendleton township	2 255	823	654	565	64	169	150	84	47	2 74	3.10	83	59	24
Perry township	7 499	2 882	2 193	1 865	251	689	621	379	310	2 60	3 02	111	100	11
Bonne Terre city	3 819	1 474	1 037	819	180	437	405	264	228	2 59	3.17	52	41	11
Flat River city (pt.)	–	–	–	–	–	–	–	–	–	–	–	59	59	–
Leadwood city (pt)	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Randolph township	8 841	3 297	2 536	2 092	361	761	669	375	310	2 68	3 10	–	–	–
Desloge city (pt.)	3 714	1 461	1 074	881	155	387	340	185	153	2 54	3 01	–	–	–
Elvins city (pt)	1 137	417	324	262	56	93	85	49	39	2 73	3 13	–	–	–
Flat River city (pt.)	32	13	12	11	1	1	1	1	1	2 46	2 58	–	–	–
Leadwood city (pt)	1 247	448	358	282	62	90	84	52	45	2 78	3 17	–	–	–
Rivermines village (pt)	62	24	20	16	2	4	3	2	2	2 58	2 80	–	–	–
St Francois township	19 819	7 930	5 562	4 472	905	2 368	2 141	1 108	943	2 50	3 03	2 963	2 662	301
Desloge city (pt.)	331	130	101	85	13	29	27	8	7	2.55	2 95	105	105	–
Elvins city (pt.)	254	94	68	52	12	26	18	10	8	2.70	3 21	–	–	–
Esther city	1 071	422	294	210	69	128	116	63	58	2.54	3 07	–	–	–
Farmington city	8 927	3 749	2 522	2 079	378	1 227	1 136	610	522	2 38	2 98	2 671	2 557	114
Flat River city (pt)	4 717	1 871	1 286	961	278	585	530	297	258	2 52	3.08	15	–	15
Leadington city	201	90	60	44	15	30	29	10	7	2 23	2 73	–	–	–
Rivermines village (pt)	345	120	90	71	12	30	24	14	10	2 88	3 31	52	–	52
St. Louis County	975 815	380 110	270 421	219 468	40 657	109 689	93 532	35 078	28 674	2.57	3 10	17 714	12 586	5 128
Airport township	33 097	13 211	8 751	5 797	2 407	4 460	3 804	1 319	1 046	2.51	3 11	182	151	31
Bel-Ridge village (pt)	215	58	51	25	19	7	5	1	1	3.71	3 80	–	–	–
Berkeley city (pt.)	10 213	3 596	2 701	1 608	910	895	769	247	190	2.84	3 31	27	16	11
Breckenridge Hills village (pt)	701	281	203	110	83	78	55	13	7	2 49	2 84	–	–	–
Bridgeton city (pt.)	883	487	207	130	57	280	218	31	23	1.81	2.52	–	–	–
Cool Valley city (pt)	6	2	1	–	1	1	1	1	1	3 00	5 00	100	100	–
Edmundson village	1 111	429	288	205	65	141	112	43	33	2.59	3.18	–	–	–
Kinloch city (pt)	2 451	788	554	167	348	234	216	123	92	3.11	3 89	–	–	–
St. Ann city (pt)	11 525	5 213	3 044	2 237	628	2 169	1 868	632	508	2.21	2.89	55	35	20
St John city (pt)	1 591	616	451	350	77	165	138	58	47	2 58	3.04	–	–	–
Woodson Terrace city	4 362	1 728	1 243	960	218	485	418	168	143	2.52	2.99	–	–	–
Bonhomme township	37 258	14 934	10 452	8 788	1 330	4 482	3 976	2 053	1 710	2 49	3.06	638	582	56
Des Peres city (pt.)	508	152	142	136	2	10	8	2	–	3.34	3.46	–	–	–
Fenton city (pt)	3 290	1 103	955	849	74	148	128	47	32	2 98	3.23	56	56	–
Glendale city (pt)	1	1	–	–	–	1	1	–	–	1 00	–	–	–	–
Kirkwood city	27 002	11 212	7 583	6 355	987	3 629	3 205	1 572	1 320	2 41	3.00	289	239	50
Sappington CDP (pt)	572	184	170	159	8	14	11	5	4	3 11	3 20	–	–	–
Sunset Hills city (pt)	4 207	1 744	1 188	1 062	100	556	514	367	313	2.41	3 01	132	126	6
Clayton township	33 996	13 708	9 848	8 601	968	3 860	3 400	1 499	1 223	2 48	2 99	891	735	156
Clayton city (pt)	7 776	3 987	1 945	1 571	290	2 042	1 741	622	523	1 95	2 75	304	304	–
Creve Coeur city (pt)	1 666	601	513	480	21	88	74	28	22	2 77	3 03	309	218	91
Crystal Lake Park city	506	209	158	139	18	51	43	22	20	2 42	2 82	–	–	–
Des Peres city (pt)	4 676	1 671	1 412	1 278	108	259	229	121	91	2 80	3 09	102	102	–
Frontenac city	3 266	1 226	1 033	953	56	193	176	85	67	2 66	2 94	108	70	38
Glendale city (pt)	117	52	32	26	5	20	15	10	7	2.25	2.81	–	–	–
Huntleigh city	392	132	118	109	7	14	14	10	10	2.97	3 16	–	–	–
Ladue city (pt)	6 990	2 651	2 166	1 987	136	485	452	249	209	2.64	2.97	–	–	–
Rock Hill city (pt)	4 260	1 606	1 167	901	205	439	406	190	150	2 65	3 21	–	–	–
Town and Country city (pt)	1 548	515	440	415	17	75	72	46	28	3 01	3 33	68	41	27
Warson Woods city (pt)	2 049	773	646	592	47	127	120	86	72	2 65	2 96	–	–	–
Webster Groves city (pt)	433	154	114	52	56	40	36	22	17	2 81	3 36	–	–	–
Westwood village	309	129	103	97	2	26	22	8	7	2 40	2 66	–	–	–

Table 5. Household, Family, and Group Quarters Characteristics: 1990—Con.

(For definitions of terms and meanings of symbols, see text)

State County County Subdivision Place	Persons in households	All households	Family households			Nonfamily households				Persons per—		Persons in group quarters		
							Householder living alone							
								65 years and over						
			Total	Married-couple family	Female householder, no husband present	Total	Total	Total	Female	Household	Family	Total	Institutionalized persons	Other persons in group quarters
Worth County—Con.														
Muddlefork township	229	89	66	59	5	23	18	13	13	2.57	3.03	–	–	–
Worth town	103	37	27	24	2	10	7	5	5	2.78	3.33	–	–	–
Smith township	183	81	57	50	6	24	22	14	7	2.26	2.70	–	–	–
Allendale town	58	32	16	14	2	16	15	11	5	1.81	2.44	–	–	–
Union township	485	215	146	131	7	69	65	46	37	2.26	2.80	–	–	–
Sheridan town	174	91	49	44	4	42	42	34	28	1.91	2.67	–	–	–
Wright County	16 558	6 510	4 725	4 059	518	1 785	1 679	998	780	2.54	3.06	200	199	1
Boone township	893	321	255	227	21	66	58	26	21	2.78	3.20	–	–	–
Brush Creek township	510	177	143	127	12	34	32	13	10	2.88	3.26	–	–	–
Clark township	1 061	400	310	261	34	90	86	56	44	2.65	3.09	–	–	–
Norwood city (pt.)	389	151	106	86	18	45	43	30	26	2.58	3.19	–	–	–
Elk Creek township	382	155	122	106	9	33	29	14	11	2.46	2.80	–	–	–
Gasconade township	1 051	381	292	256	26	89	81	46	32	2.76	3.22	–	–	–
Hartville city (pt.)	108	48	29	23	5	19	17	12	9	2.25	3.00	–	–	–
Hart township	1 061	452	292	256	28	160	154	111	87	2.35	3.03	7	7	–
Hartville city (pt.)	380	206	93	70	18	113	112	86	68	1.84	2.83	7	7	–
Montgomery township	533	189	154	134	15	35	34	16	12	2.82	3.14	–	–	–
Mountain Grove township	5 569	2 382	1 575	1 292	236	807	767	466	376	2.34	2.95	129	129	–
Mountain Grove city (pt.)	4 141	1 860	1 158	916	208	702	667	416	341	2.23	2.89	27	27	–
Norwood city (pt.)	60	26	17	15	1	9	9	4	3	2.31	3.00	–	–	–
Pleasant Valley township	2 638	1 011	730	619	94	281	258	156	120	2.61	3.15	64	63	1
Mansfield city	1 428	587	376	298	70	211	194	125	103	2.43	3.14	1	–	1
Union township	1 045	393	314	285	19	79	77	46	36	2.66	3.04	–	–	–
Van Buren township	550	194	154	144	5	40	37	16	12	2.84	3.25	–	–	–
Wood township	1 265	455	384	352	19	71	66	32	19	2.78	3.03	–	–	–
Mountain Grove city (pt.)	7	1	1	1	–	–	–	–	–	7.00	7.00	–	–	–
St. Louis city	385 916	164 931	90 945	50 557	33 864	73 986	64 677	26 519	20 788	2.34	3.21	10 769	5 900	4 869

Reference 28



CLIMATIC ATLAS OF THE UNITED STATES

1975

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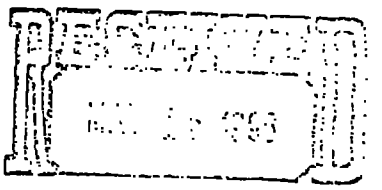
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 7
25 FUNSTON ROAD
KANSAS CITY, KANSAS 66115



DATE: May 3 1996

SUBJECT: Data Transmittal for Activity #: DC1CY
Site Description: Mound Street PCBs

FROM: Andrea Jirka, Program Manager
Regional Laboratory, Environmental Services Division

TO: Dave Crawford
SUPR

Attached is the data transmittal for the above-referenced site. The data contained in this transmittal have been approved by the Regional Laboratory. This should be considered a _____ Partial or X Complete data transmittal (completes transmittal of _____). The Project Leader should notify the Regional Laboratory with 14 days of any changes in the LAST analytical database. If you have any questions, comments, or data changes, please contact Dee Simmons at 551-5129.

Attachment

cc: Analytical Data File

United States
Environmental Protection
Agency

Office of Emergency and
Remedial Response
Washington DC 20460

EPA 540-R-92-021
Directive 9345.1-05
September 1992

Superfund

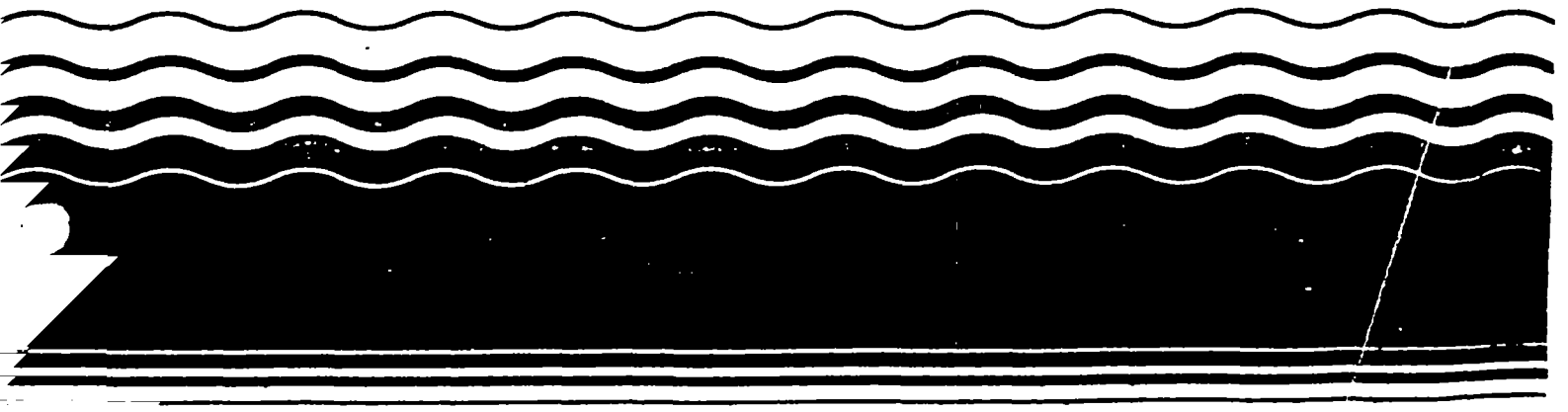
EPA

Guidance for Performing Site Inspections Under CERCLA

Reference 30

includes revised
C-33
C-44

Interim Final



United States
Environmental Protection
Agency

Office of Emergency and
Remedial Response
Washington, DC 20460

Publication
September 1995

Superfund

EPA

Superfund Chemical Data Matrix

Reference 31

EPA540-R-92-026
OSWER Directive 9340.1-07
November 1992

Reference 32

The Hazard Ranking System Guidance Manual

Interim Final

Hazardous Site Evaluation Division
Office of Solid Waste and Emergency Response
U.S. Environmental Protection Agency
Washington, DC 20460

Friday
December 14, 1990

Reference 34

Part II

Environmental Protection Agency

40 CFR Part 300

Hazard Ranking System; Final Rule